

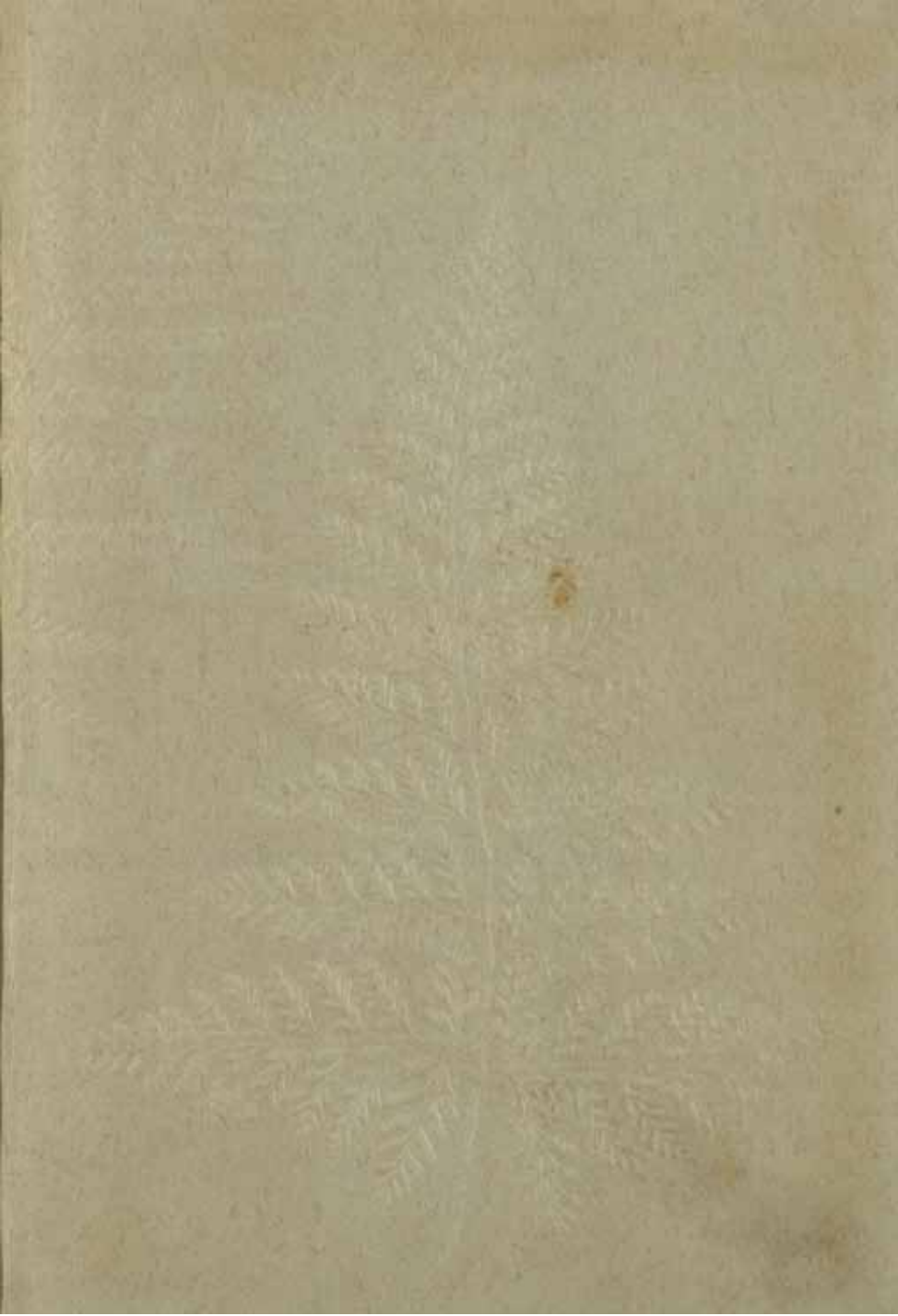
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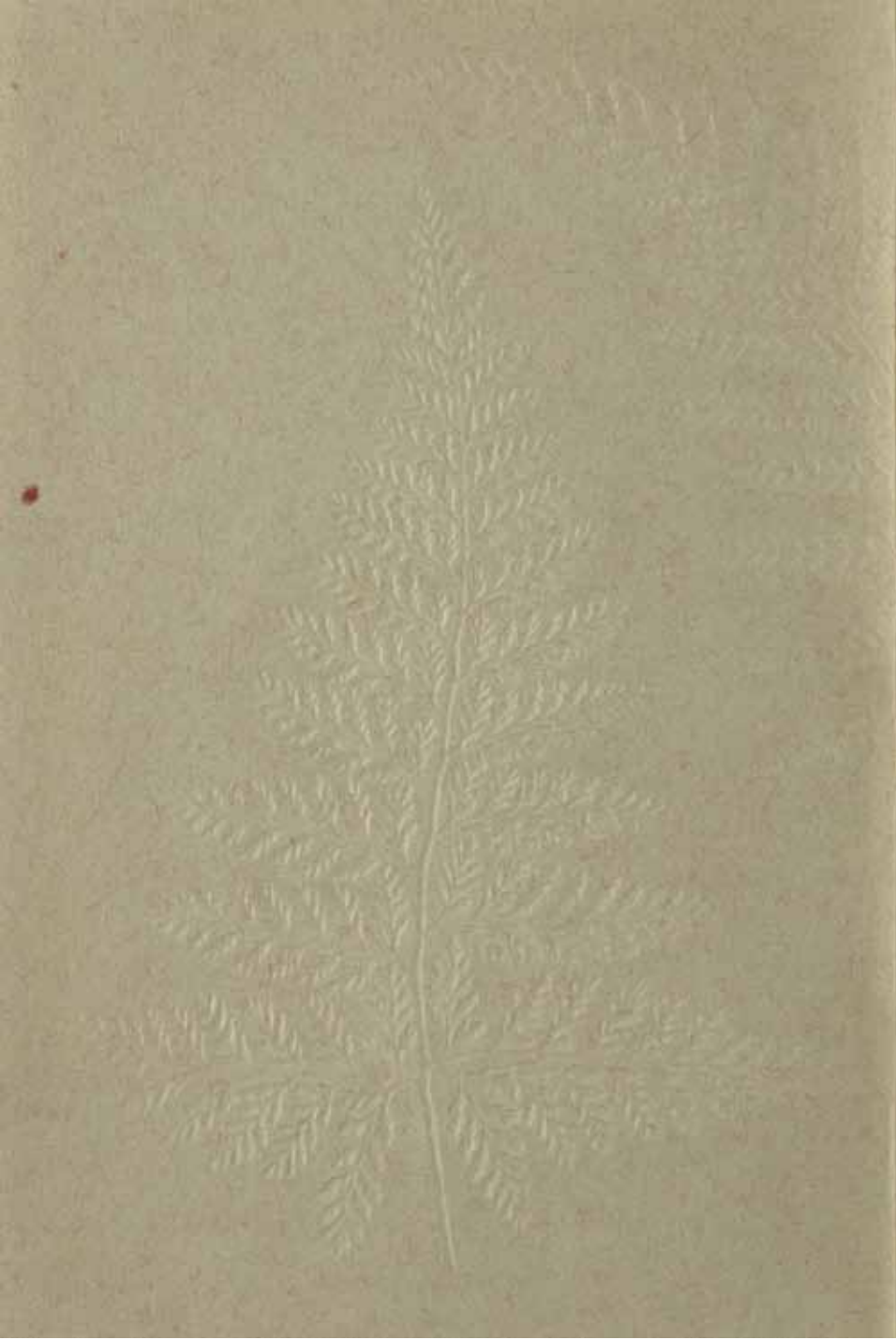
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THE READER'S DIGEST ASSOCIATION  
LONDON

FIRST EDITION  
THIRD REVISE

*Published by*  
THE READER'S DIGEST ASSOCIATION LIMITED  
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# CONTENTS

## Volume 1

PREFACE	page 11
TODAY'S GARDEN	14
HOW PLANTS LIVE	46
THE SOIL	76
GENERAL SOIL OPERATIONS	93
DRAINAGE	98
FERTILIZERS AND MANURES	101
COMPOSTING AND GREEN MANURING	111
PROPAGATION	116
ANNUALS	144
BIENNIALS	169
HARDY PERENNIALS	174
CHRYSANTHEMUMS	221
DAHLIAS	238
ROSES	252
SWEET PEAS	273
ALPINES FOR THE ROCK GARDEN	279
ROCK GARDEN CONSTRUCTION	296
BULBS	304
LILIES	321
GLADIOLI	332
THE LANGUAGE OF FLOWERS	340
PLANT DISEASES	347
GARDEN PESTS	380
GARDEN WEEDS AND THEIR CONTROL	411
CALENDAR OF WORK	425

## CONTENTS

### Volume 2

THE WATER GARDEN	page 456
PRINCIPLES OF PRUNING	485
SHRUBS AND TREES	492
RHODODENDRONS AND AZALEAS	532
CLIMBERS AND OTHER WALL PLANTS	539
HEDGES	548
FOLIAGE	561
FERNS	580
ORNAMENTAL GRASSES	589
LAWN MAKING AND MAINTENANCE	594
LAWNS FOR RECREATION	609
CACTI AND SUCCULENTS	614
HOUSE PLANTS	632
INDOOR GARDENING	667
FRUIT	680
HOME WINE-MAKING	823
PRESERVING	832
HERBS	858

## CONTENTS

### Volume 3

THE USE OF GLASS IN THE GARDEN	page 880
ELECTRICITY IN THE GARDEN	913
ORCHIDS IN THE GREENHOUSE	920
CARNATIONS	929
FLOWER ARRANGEMENT	942
VEGETABLES	968
EXHIBITING	1062
CHILDREN'S GARDENS	1074
PLANTS OF THE BIBLE	1088
TOWN GARDENS	1094
GARDEN CONSTRUCTION	1116
ANIMALS, BIRDS AND INSECTS IN THE GARDEN	1158
NOTES ON GARDEN LAW	1194
NATURE CALENDAR	1201
THE GARDEN DURING SUMMER HOLIDAYS	1217
LATIN NAMES AND THEIR MEANINGS	1218
GLOSSARY	1224
BIBLIOGRAPHY	1226
INDEX	1228





A corner of a well-stocked plant house in the early summer. All these plants can be taken into the house to provide decoration, and later can be returned to the greenhouse



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## The Use of Glass in the Garden

### THE GREENHOUSE

A GREENHOUSE, however small, opens up new vistas and offers the gardener endless possibilities and delights. In a greenhouse, whatever the weather, even the more tender plants are well protected, and pot plants and bedding plants will flourish. It is possible to pick tomatoes and cucumbers at a time when they are expensive to buy, while other vegetables that are started in the greenhouse, such as cauliflowers, onions and leeks, will produce a heavier yield when planted out-of-doors later on. Alpine flowers in winter, carnations or cacti and succulents are but a few of the choices open to the greenhouse owner.

Never erect a greenhouse without the

approval of the local authority and, if a tenant, the landlord. If a greenhouse is built against the wall of a house, the local council may insist that the base be built of bricks on a suitable foundation, and that the structure does not interfere with the external ventilation of a living-room. If the greenhouse seems likely to increase the rental value of the property, there will probably be a small additional rate assessment.

#### TYPES OF GREENHOUSE

There are four principal types of greenhouse: the span-roofed, the lean-to, the three-quarter span and the Dutch light.

The span-roofed house is ideal, for it





#### SPAN ROOF HOUSE

This free-standing building is the best type of greenhouse—where there is sufficient space for it. As light enters from both sides, plants tend to grow more sturdily and without the tendency to "draw" to one side

can be erected in an open position and admits more light than either the lean-to or three-quarter span types. It also lends itself to interior staging, which can be adapted to suit many different types of plant. Staging may be erected on one or both sides to accommodate pot plants, or removed for growing crops in the soil at ground level.

The Dutch light type of house, although unsuitable for staging, also admits the maximum amount of light, and its height particularly assists the cultivation of plants that grow in the ground soil, such as tomatoes in summer and chrysanthemums in winter.

A three-quarter span house is preferable to a lean-to, as it naturally admits more light. A lean-to house should be built against a south wall, so that it receives direct sunshine for most of the day, and it should never be overshadowed by trees or hemmed in by buildings.

Nothing can compensate for natural sunlight, although it is possible to use special electric lamps to supplement daylight under certain conditions. (See *Electricity in the Garden*.)

If the greenhouse is to be used mainly during the summer then a north-south setting is the best, but one that is used during the winter months as well will receive the maximum amount of light if placed from east to west.

#### BUILDING MATERIALS

All greenhouses will last longer if built on a low brick wall laid on a good concrete foundation.

A wall that is too high reduces the amount of sunlight admitted to the house. A 3-ft. wall is generally suitable for span-roofed and three-quarter span greenhouses. For the lean-to type of house an outside wall of 2 ft. is sufficient, the vertical glass framework above being

## THE USE OF GLASS IN THE GARDEN



### DUTCH LIGHT HOUSE

This type of greenhouse is designed to admit the maximum of light to plants such as tomatoes and chrysanthemums which are grown in the ground soil



### THREE-QUARTER SPAN HOUSE

Admitting more light than a lean-to, but less than a span roof, this type of greenhouse makes an ideal vinery



### LEAN-TO HOUSE

Built as one side of a normal greenhouse, a lean-to should be erected against a south-facing wall, where it will receive direct sunlight for most of the day

about 3 ft. high. The sloping sides of the Dutch light house should rest on an even lower wall, about 1 ft. high.

Wood is much used for greenhouse construction, for it retains warmth, and shelving is easily fixed to it.

Cedar wood is extremely durable and need not be painted outside, though if red cedar wood is used, it should be oiled with linseed oil every four or five years. All wood inside the greenhouse should be painted regularly with glossy white lead paint, both as protection and also to reflect light.

Special types of aluminium are also used for greenhouse construction, for it is possible to make the supporting bars narrower and therefore admit more light. Also, metal does not harbour pests. Aluminium, however, does not retain heat as well as wood, nor is it so easy to attach supports for plants to it.

### GUTTERS AND WATER TANKS

Provide good guttering all round the greenhouse so that rain water is carried away quickly, either into drains or into a storage tank, with an overflow to a drain. Water tanks are best kept outside the greenhouse, for they are apt to become contaminated if kept inside.

### HEATING

Before building a greenhouse, it is important to decide which of the many different methods of heating is to be installed, although heating is unnecessary if the house is to be used only for raising annuals, such as sweet peas, for planting out in the spring. The most common is a boiler for heating water, which then circulates through pipes built underneath the staging round three sides of the greenhouse. The water will remain hot for a long time, and is said to create a better climate for plants than dry electric

heat. Take the advice of engineers when installing hot-water pipes, to ensure a correct flow of water and to make the best use of the space. Four-inch pipes are usually considered the most efficient.

Only a full-time gardener should use a boiler that burns coke, Phurnacite or anthracite, for it needs stoking regularly night and morning, and sometimes in the middle of the day as well. The magazine-type boiler requires less attention, because the fuel trickles down automatically, and the draught regulator can be fitted with thermostatic control. This also applies to the automatic gas boiler, which should, however, be installed with the assistance of the local gas company, to be sure that no gas fumes escape into the greenhouse.

Oil heating is effective, and an oil burner can be fitted into an existing solid fuel boiler. It is advisable to discuss the installation of such a burner with an oil-heating firm. The water in the pipes may also be heated with electricity, by using an immersion heater.

The panel type of electric heater is both neat and efficient, and has a water trough incorporated above it. Alternatively, tubular electric heaters may be fixed beneath the staging. In a small greenhouse it is also possible to use a convector heater. (See also *Electricity in the Garden*.)

Do not be tempted to use paraffin oil heaters, except in an emergency, as fumes can damage plants.

### CONSERVATION OF HEAT

The larger the greenhouse, the easier it will be to maintain a healthy temperature. Also, a large greenhouse can be divided into two parts, one of which, the stove house, will have a temperature of about 60° F. (16° C.), while the other part remains a cool house, with a temperature of 45 to 50° F. (7 to 10° C.).



Try to maintain a steady temperature, but do not be unduly worried by a rise in temperature caused by the sun alone. A rise of 15° F. (8° C.) due to the sun may do no harm, whereas a rise of 8° F. (4° C.) from artificial heating can cause considerable damage.

It is very important to conserve heat in a greenhouse, but extremely difficult to insulate the panes of glass without reducing the amount of light.

The best form of insulation is a translucent plastic material such as Thermo-plus (polythene), which may be fastened with drawing pins or adhesive tape to the roof bars inside the glass, leaving a gap of at least 1 in. between the plastic and the glass pane. Heat is conserved by this layer of static air, and it is even possible to increase the temperature by as much as 10° F. (6° C.). To maintain a normal temperature, about 40 per cent less fuel will be required. However, this method does cut down the amount of light reaching the plants.

Dripping water from condensation may cause damage to plants underneath; it can be avoided by using a special plastic sheeting which channels the water to the outside edges of the sheets, to run away safely.

Another method of conserving heat is to use an outside blind made of hessian, treated with green Cuprinol to prevent it from rotting. Fix the blind to the top of the house so that it can be rolled down in the evening when the sun has gone down, and rolled up again as early as possible in the morning.

Even a 9-in.-thick brick wall will allow a great deal of heat to escape. Seal all cracks and crevices in the woodwork, glass or brickwork with a special mastic preparation such as Seelastic, which can be applied with a special Expandite gun. Sylglas adhesive glazing tape used on the outside bars acts as an efficient seal, and

also as a protection if the greenhouse is built of wood. Two or three coats of thick white paint on the inside walls will seal any cracks in the brickwork. This treatment not only conserves heat, but also prevents insect pests from hiding in the mortar between the bricks, and increases reflected light.

It is inadvisable to seal permanently the slight gap that is usually found along the line of the eaves, between the top rails and the glass. This gap provides for the escape of condensed moisture, which can harm plants in cold weather, when the atmosphere in the greenhouse needs to be kept dry. However, if continuous icy blasts should find their way in on a cold night, block the gap temporarily with strips of sodden newspaper.

Rubber flaps nailed to the bottom of the inner side of the door will help to make the greenhouse airtight; on frosty nights, lay a strip of sacking outside the door.

Always put the main door of a greenhouse on the more sheltered side, as a protection against draughts and wind.

## VENTILATION

Plants need fresh air as well as warmth, and all free-standing greenhouses should have a ventilator on each side of the roof. A lean-to house should have ventilators at each end of the roof. Generally, a ventilator should be 4 ft. wide and 2 ft. deep for every 8 ft. of greenhouse. When growing tomatoes, it is an advantage to have ventilators at the ends of the house as well, so that the air can move constantly and there is no danger of the atmosphere becoming stagnant and causing tomato mould disease.

Most ventilators are worked by hand. It is also possible to install automatic ventilators, which operate on a thermostat and open and close according to the heat in the house. Certain firms specialize in automatic ventilation.

The movement of air in a greenhouse is influenced by the position of the sun and the direction of the wind, but generally the hot air rises and flows out of the top ventilators, and cold air enters to take its place. Open the ventilators early in the morning if a rise in temperature is expected; close them partially in the afternoon, and close them fully when the sun goes down, in order to trap the remaining heat of the sun and save fuel. In midsummer it may be necessary to keep the ventilators open all night.

Although ventilators may be opened suddenly, a fully opened ventilator should not be closed suddenly because of the possibility of excessive condensation. On a damp, dull day, when the air in the greenhouse tends to be sluggish, use more heat to encourage the air to circulate, and give a certain amount of ventilation, even if the temperature outside is fairly low. Never open ventilators on the windward side, during high winds, for fear of draughts.

### SHADING

Blinds, already mentioned as a means of conserving heat at night, are even more important to prevent strong sunshine scorching the leaves of plants, and to keep the temperature of the greenhouse

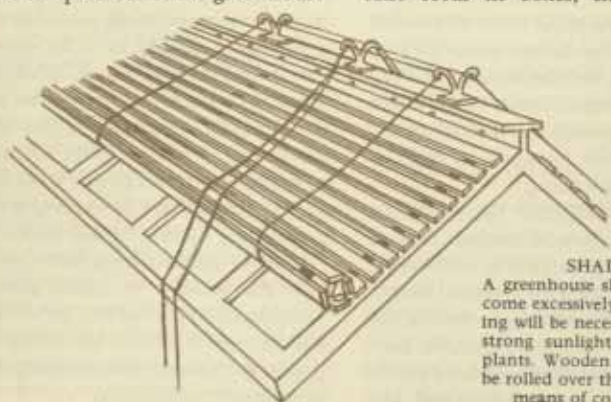
within reasonable limits on a hot, sunny day. Never allow a greenhouse to become excessively hot, for the plants will be unable to "pump" enough moisture into their leaves to keep cool, and will suffer in consequence.

The best type of blind is that made of very thin but hard wooden laths  $\frac{1}{2}$  in. wide. These are linked by metal clips so that a gap of  $\frac{1}{2}$  in. is left between each lath. Fix the blinds to the outside of the roof at the top so that they can be rolled up and down quickly by means of pulleys and cords. If ventilation is needed at the same time as shading, cut away the laths over the roof ventilators and attach the cut-out pieces to the ventilating sashes. Some firms provide wooden lath blinds with the greenhouse.

Another means of shading in summer is to spray the outside of the greenhouse with a special distemper-like solution, a light lime wash or, most adhesive of all, a thin flour paste. The disadvantage of spraying is that if the weather changes, it is difficult to remove the shading quickly to let in the sunlight, and it is also a fairly arduous task to wash it off for the winter.

### STAGING

If it is intended to grow pot plants or raise seeds in boxes, the greenhouse



### SHADING

A greenhouse should never become excessively hot, and shading will be necessary to prevent strong sunlight scorching the plants. Wooden blinds that can be rolled over the roof-lights by means of cords are ideal



should be equipped with either permanent or temporary staging at a convenient height, usually about 3 ft. above ground level. Staging is usually made of aluminium, or of the same wood as the frame of the greenhouse. In the latter case, it should be painted with at least three coats of good white lead paint.

Fit sheets of corrugated iron or asbestos over the staging, and cover the sheets with washed gravel, pea shingle or large breeze, to ensure good drainage and to allow for aeration. Stand the pots and boxes on the shingle, which should be raked smooth and level from time to time, and always kept free from moss and algae.

If the staging is to be temporary, slatted bars resting on legs like those of a table usually replace the corrugated iron. The entire staging can then easily be removed at the end of the propagating season, and plants can be grown in the ground soil.

### PROPAGATING EQUIPMENT

A simple propagating box with a glass or polythene top can be placed on the staging near the boiler. The front of the box should be about 6 in. deep, and the back about 7 in., so that the glass slopes. Place the box so that it faces south, and fill it to within about 1 in. of the glass with a mixture of coarse silver sand and very fine peat, which should be carefully levelled.

Electrically heated frames are also available, the rising heat providing ideal conditions for rooting cuttings easily. (See *Propagation*.)

### POTS AND POTTING COMPOSTS

A recent development of great importance to the gardener is the production of pots of various types of plastic, which have several advantages over the clay pot. The principal materials used are extruded polystyrene and Alkathene,

which are easy to clean, and can therefore be sterilized or thoroughly cleaned at the end of each season. These pots are extremely light, and fit neatly into each other, so that large numbers can easily be stored or moved from place to place. They are also virtually unbreakable.

A plastic pot retains moisture better than a clay pot, and the extruded polystyrene also holds the warmth of the greenhouse or room, thus raising the temperature of the soil slightly and promoting better root action. Polythene pots are produced in a range of gay colours, and although a little more expensive than clay pots, they will last much longer.

The type of soil in which a greenhouse plant is potted is of great importance. The simplest and most efficient compost for raising seeds in either boxes or pots is the John Innes seed compost. This consists of two parts good sterilized loam, one part peat and one part coarse sand (all parts by bulk). Add to each bushel of this mixture  $1\frac{1}{2}$  oz. superphosphate of lime and  $\frac{3}{4}$  oz. ground chalk.

When the seedlings are large enough to be repotted, one of a number of John Innes potting composts is used. The standard mixture consists of seven parts fibrous loam, three parts peat and two parts coarse silver sand (all parts by bulk), with the addition of fertilizer: 4 oz. John Innes base and  $\frac{3}{4}$  oz. ground chalk or limestone per bushel. The John Innes base is composed of two parts hoof and horn meal, two parts superphosphate of lime and one part sulphate of potash (all parts by weight), and can be obtained already mixed from horticultural sundriesmen. The total mixture is known as John Innes potting compost No. 1.

Some plants, particularly at the second or third potting, need a stronger compost than this, and should be given John Innes potting compost No. 2, which simply indicates that double the quantity

of fertilizer (8 oz. base and 1½ oz. chalk) is used per bushel. The even stronger John Innes potting compost No. 3 contains three times the amount of fertilizer per bushel.

Instead of the John Innes potting composts, an Eclipse No-Soil compost may be used. This can be bought ready made up, and only needs the addition of the special plant foods that are provided in a separate plastic bag, and which should be used in accordance with the directions on the packet.

### WATERING AND DAMPING DOWN

Damage can be caused both by under-watering and by over-watering plants under glass. Never give little sprinklings of water, but do the work thoroughly. Water in the evening during the summer and at about 10 a.m. in winter, using rain-water when possible, particularly in districts where the tap-water is hard. Syringeing the plants and watering the paths and walls in summer, a process known as damping down, creates a good moist atmosphere and provides a kind of natural dew, thus preventing the plants from transpiring too much. Do not damp down in winter, except in warmer greenhouses, and be careful not to spray inactive or hairy-leaved plants, or those in full flower.

If the ground soil in the greenhouse is used for growing crops, the drainage should be perfect. Water does not drain as easily in a greenhouse as in the open, and the soil should never be allowed to become stagnant.

### HYGIENE

The greenhouse should be kept perfectly clean. Regularly pick off and burn dead flowers and leaves, and never allow moss and algae to accumulate on the top of the compost in pots. Scrub and white-

wash the inside walls of the greenhouse once a year, and clean the outside of the glass thoroughly in late September or early October. Paint wooden greenhouses with a genuine white lead paint at least once every three years.

### FUMIGATION

Greenhouse pests and diseases can be controlled by fumigation, a process usually known as "smoking". Pesticidal smokes control all insect pests, while fungicidal smokes prevent fungus diseases such as botrytis and mildew.

Smoke bombs are available in various sizes, and produce a clean cloud of microscopic particles of insecticide or fungicide, which fills every crevice and covers every surface of the greenhouse. If the correct bomb is used, the smoke cannot taint food or harm crops. (See the section on greenhouse pests in *Garden Pests*.)

Use smoke bombs in calm, warm weather, but never in bright sunshine. First work out the cubic capacity of the greenhouse, as shown in the diagram, and use one small pellet smoke bomb for every 500 cubic ft., or one cone smoke bomb for every 600 cubic ft.

Make the greenhouse as smoke-tight as possible. Just before closing down for the night, light the first bomb at the far end of the house and others at intervals while moving back towards the door. As soon as the last bomb has been lighted, shut the door firmly, and keep it closed overnight. Be sure to put up a warning notice outside: "Do not enter; house being fumigated".

Further bombs may be lighted once a month as a preventive measure, and if infection should occur, light bombs once a fortnight until the trouble is controlled.

When using fungicidal smokes, fumigate 24 hours before planting, so that all fungus spores are killed.



## FRAMES AND CLOCHES

Like a greenhouse, "cold glass", in the form of frames or cloches, makes it possible to grow plants out of season. Seeds germinate better under glass when weather conditions are unfavourable, and the less hardy plants can be protected and kept warm.

Cloches, being portable, are perhaps easier to manage than frames. However, frames preserve warmth more effectively, and so enable a wider range of plants to be grown.

## FRAMES

The three types of frame most commonly used are the wire sectional frame, the permanent frame, which can be heated, and the type covered by Dutch lights. Movable frames have sides made of wood, the sides of the permanent type of frame being made of brick or concrete. Frames are generally 2½ ft. high at the back, and 2 ft. high in front; a back wall that is too high will throw too much shade, and will also make it difficult to keep a level bed in which every plant lies at the same distance from the glass. The light covering the frame is usually 3 ft. wide and 5 ft. deep.

A cold frame should always face south and should be provided with a hessian blind for protection in winter, and sometimes from direct sun in midsummer.

Take great care when watering plants grown in frames, because there is little space between the soil and the glass and the atmosphere can therefore quickly become saturated.

Never water in cold, frosty weather, and keep the soil fairly dry. In midsummer, however, when it is sunny and hot, remove the lights completely to prevent the air drying out, and then water as necessary.

## WIRE SECTIONAL FRAME

The best portable frame is the sectional wire frame, or ganwick, sometimes known as a flat-topped cloche. As well as being easy to move, these cold frames are convenient in that they allow both rain and the maximum amount of light to reach the plants; they have automatic ventilation; and they are inexpensive.

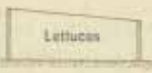
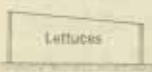
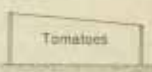
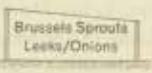
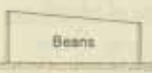
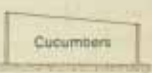
The best type of sectional frame is known as the Double 18, which is 1½ ft. high and can be assembled in any length. The average vegetable garden will accommodate three rows of these frames, each 10 ft. long. The crops can easily be reached if the single square of glass that covers each section of the frame is removed.

If three frames are used, the first could hold lettuces from October to January and could then be moved to a new site for marrows. Remove the top panes of glass in June, and the plants will continue to crop until October when the frame is needed for lettuces again.

The second frame could take radishes from October to January, and could then cover lettuces, on a new site, until April. These could be replaced by tomato plants, set out 1 ft. apart and trained along a stout stake running almost horizontally, which will crop between July and the end of September, when the sectional frame should be moved again in preparation for a new sowing of radishes.

The third frame could be used for raising such vegetables as cauliflowers (sown in September), Brussels sprouts, leeks, lettuces and onions (all sown in January). All these vegetables should be planted out-of-doors in March. Then move the frame to accommodate runner beans down the centre and dwarf french

## THE USE OF GLASS IN THE GARDEN

	October - January	February - May	June - September
FIRST FRAME			
	October - January	February - April	May - September
SECOND FRAME			
	January - March	April - June	July - September
THIRD FRAME			

### HOW TO USE THREE MOVABLE FRAMES

beans on either side—sow a dwarf variety of runner bean, like Hammond's Dwarf Scarlet, or remove the frame when the beans need the extra height. In June, when these no longer need cover, move the frame again to cover six cucumber plants, which will yield a heavy crop later in the summer.

#### THE PERMANENT FRAME

A permanent cold frame is built with brick or concrete sides, and is used for raising seedlings of all kinds, as well as for rooting cuttings that require only slight protection. Tender plants that have been raised from seed in the greenhouse will harden well if moved to the cold frame in April, before finally being planted out in the garden in late May or early June.

Use the cold frame also to protect tender herbaceous plants during the winter, or to grow early crops of carrots and radishes.

Pot plants that have finished blooming in the greenhouse may be rested in a cold frame during the summer.

A permanent frame may be heated with hot-water pipes, or by electricity,






in which case special wires generally run through the soil. A heated frame is extremely useful for raising plants of all kinds, for early salad crops, and for such crops as cucumbers and melons, which need heat if they are to be produced early.

#### THE DUTCH LIGHT FRAME

The Dutch light frame has as a foundation a simple wooden box framework, 15 in. high at the back and 9 in. high in the front. The most convenient size of frame will accommodate three separate Dutch lights on wooden frames, which should fit snugly into the box frame. A Dutch light is a simple wooden framework with sides grooved to receive a single sheet of 24-oz. glass, 4 ft. 8 in. by 2 ft. 4½ in. To prevent the lights from being blown off, secure them with wires nailed to the frame. Treat the wood of the framework with Cuprinol, but never with creosote, which may damage the plants.

The soil under the Dutch lights should be rich in organic matter, and it is advisable to fork into each frame 1½ bushels of fine peat and 1 lb. of fish manure with a 5 per cent potash content. When the soil

## THE USE OF GLASS IN THE GARDEN

	January - March	April	May - June	July - August	September
1		Lettuces	Lettuces	Lettuces	
2			Peas	Peas	
3				Sweet Corn	
4					
5			Tomatoes	Tomatoes	

### FIVE-STRIP SYSTEM FOR CLOCHES OR GANWICKS

Lay the cloches out close together in a row and move them 1 ft. at a time

has been prepared, place the glass over the frame to warm the soil before sowing.

Place Dutch light frames in a sheltered spot where they will receive unobstructed light. They are not, of course, automatically ventilated, so use wooden blocks to raise the frame lights at the bottom or at the top, depending on the direction of the wind. Open the frames at 9 or 10 o'clock in the morning, depending on the time of year, and close them when the sun sinks. Never ventilate when rain might drive in, or when there is fog or frost. After a sharp night frost, however, open the lights at the bottom so that some air enters before the sun gets strong enough to cause a sudden thaw, which may damage the plants.

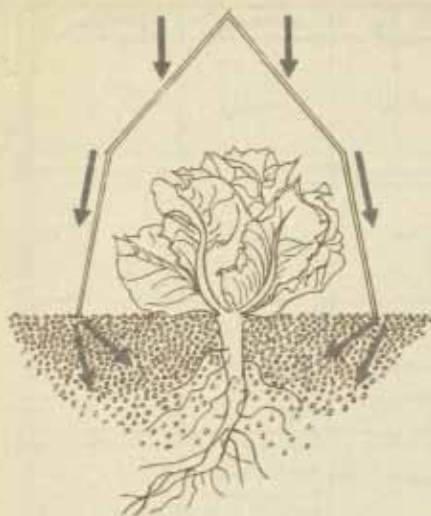
A triple Dutch light frame might be used as follows: one light for lettuce from late September until December, followed by radishes until April; the other two lights could hold carrots from October until April. From April until the end of September all three lights could be used for dwarf tomatoes.

Alternatively, dwarf beans would grow from September to November, followed by lettuce and cauliflower until late April. From May till September, one light could be devoted to melons, and the other two to cucumbers.

### CLOCHES

Like the sectional wire frame, cloches are portable. Since it is usually convenient





## MOISTURE FOR ROOTS

A cloche is designed to form a watershed so that the rain falls away from the collar of the plant yet reaches the roots

to move them no more than about 2 ft. at a time, they are best laid out, as close together as possible, in a long straight row and moved according to a strip system. The cloches can then be in use for the whole of the year. The five-strip system is particularly successful, and is arranged as follows: 1. lettuces; 2. peas; 3. sweet corn; 4. cucumbers; 5. ripening tomatoes; 6. lettuces again, and so on. In April, move the cloches from strip 1 to strip 2 so that the lettuces, planted in

October, remain in the open. A month later move the cloches on to strip 3 to cover the sweet corn, leaving the peas in the open. By the end of June the sweet corn will no longer need protection, and the cucumbers can therefore be covered from July to August. By then the tomatoes that have been growing in the open since June will need help in ripening off. After cutting them from their stakes, cover them with the cloches from the cucumbers. When the tomatoes have been picked, in mid-October, the cloches are again free for newly sown lettuces.

Rows of cloches can also be used for raising flowering annuals, which are usually sown in February, March and September. September sowing is particularly satisfactory, for the cloches can be removed early in April and used for other crops, such as half-hardy annuals, which are sown at that time, on the spot where the plants are to flower. Perennials that come true from seed are usually sown under cloches in mid-March. If bulbs are to be bought into flower early, plant them out-of-doors at the normal time, and place cloches over them in November. Violets can be covered with cloches from October until the middle of March. A fortnight before planting gladiolus corms, usually about the beginning of March, put the cloches into position to warm the soil. Keep them on after planting and remove them when the gladiolus spikes touch the glass.

## PLASTICS IN THE GARDEN

## GLASS VERSUS PLASTICS

Despite some small loss due to reflection and absorption, glass transmits all the light that plants need. It is easily cleaned, is durable, and any water on it escapes quickly. On the other hand, it is fragile and needs a rigid structure to support it.

Glass is extremely efficient in conserving heat, whereas polythene, being less transparent, is highly susceptible to all forms of radiation, both hot and cold. The temperature under polythene can actually be *lower* than in the open, and is usually 10° F. (5° C.) or lower than that

in a glass greenhouse. However, the thicker transparent plastics, such as PVC, rival glass in their efficiency, and are extremely versatile.

### GREENHOUSES, FRAMES AND CLOCHES

Inexpensive greenhouses, frames and cloches can be constructed of plastic or polythene, which for outside covering should have a gauge of at least 500. The material is light, and only a simple and reasonably light wooden framework is needed. The plastic is held between strips of wood, which can be screwed down after the plastic has been stretched taut, making it possible to construct greenhouses and frames of various sizes.

Although plastic loses heat quickly at night, it does enable the gardener to raise plants in early spring, and to produce early crops of such summer vegetables as tomatoes and cucumbers. Condensation may however be extremely heavy unless the house or frame has plenty of ventilation and a reasonable amount of

heat. Since plastic and polythene do not last much more than 18 months or two years, depending on weather conditions and the position of the structure, it is usually uneconomical to use these materials for large greenhouses.

Plastic is particularly valuable in the construction of cloches, when it can be mounted on a simple wire or wooden framework. These structures are very light, and should be well anchored into the ground to prevent them from being blown away or disturbed.

### PLASTIC SHEETING

Polythene sheeting is extremely useful for protecting plants from rain, and it also makes an excellent lining for a glass greenhouse, as a means of conserving heat. In this case, thin material of 50 or 150 gauge should be used. (See Conservation of heat.)

Sheets of green polythene can be used to shade the greenhouse, and can either be attached inside the house or purchased as ready-made roller blinds.

## PLANTS UNDER GLASS

### CUCUMBERS

#### VENTILATION, HEAT AND SHADE

The best greenhouse for cucumbers is 15 ft. wide, with a 3-ft. gap between the staging and the roof. Ventilate the house with extreme caution, and close the ventilators quite early in the afternoon. About July a little extra ventilation may be given on the sheltered side to change the air in the house.

Never allow the atmosphere of the cucumber house to become dry, and maintain at all seasons a night temperature of 65° F. (18° C.), which in the daytime may rise as high as 90° F. (32° C.). Syringe the plants frequently, and damp down the walls and paths of the green-

house, especially during the hot weather. Give the plants a feed of diluted liquid manure once a week.

When the sun becomes bright and scorching during the summer months, shade the greenhouse with a blind over the outside of the glass.

#### SOWING

Cucumber seeds are sown in February or March in 3-in. pots, in a compost of three parts loam and one part peat. The bottom of the pot should be well crocked and filled to a depth of 1 in. with rough peat. Place one seed point downward  $\frac{1}{2}$  in. deep in the centre of each pot, cover, and water well. Place the pots on a shelf that has heating close below it.

## REPOTTING

After a fortnight the small plants should be planted out in their beds, but if these are not yet ready, or if the plants are ultimately to be planted out in the garden, replot the cucumbers in 5-in. pots, using a similar compost, but with twice as much peat. The cucumber is one of the few plants that should not be potted firmly. Insert each plant right up to the seed leaf, and again water well. Thereafter, water only when the soil appears dry, for the roots will not develop well in continually wet soil.

After a week the plants will need support; push into the soil a piece of fine bamboo  $1\frac{1}{2}$  ft. long, and tie the stem to it loosely in order to allow for growth.

## MAKING UP THE BED

At least two weeks before planting out, make a bed  $1\frac{1}{2}$  ft. wide at the base and 1 ft. wide at the top. Be sure that there is good drainage, for water must be able to escape quickly. Use any open-textured organic material for the base of the bed; baled straw makes a good border. Over the

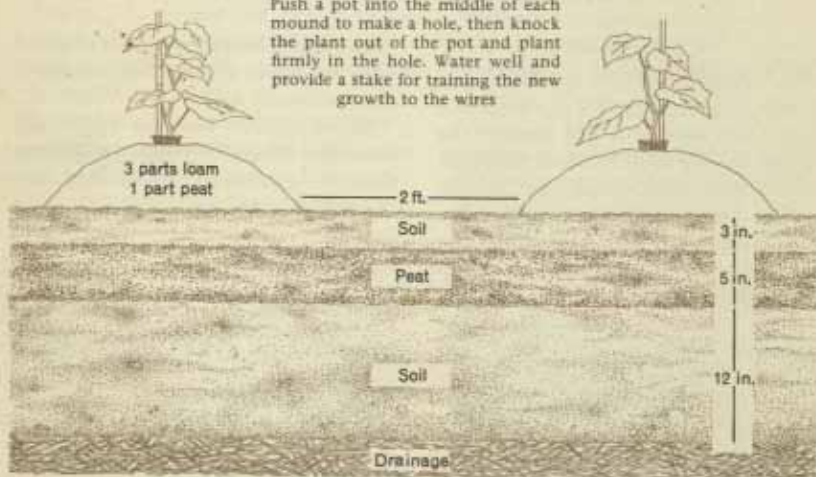
base lay 1 ft. of soil, followed by peat, which should always be kept slightly moist. A further 3 in. of sterilized soil may be placed over the peat. On the surface of the bed, build mounds of a good rich compost, three parts loam, one part peat. These should be moderately firm, about 2 ft. apart, and so arranged that drips from the rafters will fall between them. Warm the soil for a week before putting in the young plants.

## PLANTING OUT

At the end of May, when all fear of frosts is past, the young cucumbers may be planted out-of-doors. If they are to continue growing in the greenhouse, transfer them from their 3-in. or 5-in. pots to their permanent bed when they are 6 in. tall. Immerse a pot in the middle of each mound to make a hole the size and shape of the ball of soil in the pot. Then knock the plant out of the pot and plant it firmly in the hole. The top of the plant ball should be slightly above the surface of the bed. Water well, giving 1 gal. to every three mounds, and provide a stake

## CUCUMBER BED

Push a pot into the middle of each mound to make a hole, then knock the plant out of the pot and plant firmly in the hole. Water well and provide a stake for training the new growth to the wires





for training the new growth to the wires of the house.

#### STOPPING AND TYING

Cucumbers should be trained up wires stretched the length of the greenhouse, 6 in. apart. Pinch back each plant when it reaches the fifth wire; this enables the lower fruit to swell more quickly. Do not allow any cucumbers to grow on the main stem. Stop the main laterals at the second leaf joint, and the sub-laterals at the first joint, keeping two fruit-bearing joints on each lateral. Remove all male flowers. Tie all growths to the wires loosely, to allow for growth. All fruit should hang well clear of ties and wires.

#### WATER AND MULCH

Soak the bed thoroughly twice a week with water of the same temperature as the greenhouse. If a water barrow is left in the greenhouse for 24 hours, the water will heat naturally.

It is essential to mulch cucumbers regularly with soil and peat mixed in equal parts. Leave the soil in the greenhouse for at least 12 hours before it is needed. Give the first top dressing about ten days after planting, and a second one as soon as the white root fibres appear on the surface of the soil. Use only a small quantity of mulch each time.

#### VARIETIES

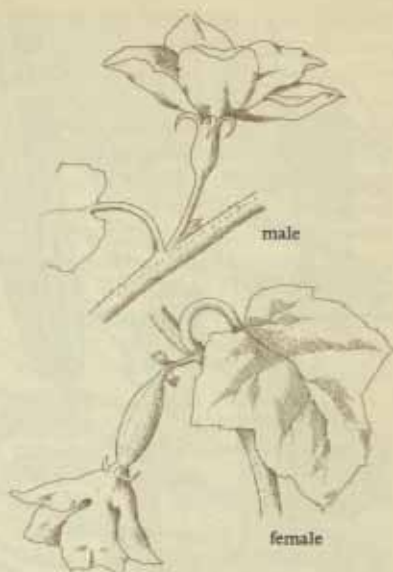
The following varieties are recommended for cultivation in the greenhouse:

Butcher's Disease Resister, a heavy cropper and popular because of its immunity from spot disease.

Excelsior Telegraph, a long, smooth variety that yields a heavy crop.

#### GRAPES

Grapes can be cultivated in the most simple greenhouses, as long as the structure faces south to make use of the maximum amount of sun. The lean-to type of greenhouse is ideal.



CUCUMBER FLOWERS

The male flower has a thin stalk; the female flower has an immature cucumber behind it. Pick off the male flowers as they appear

#### TEMPERATURE

If vines are to be grown in the same greenhouse as other plants, the latter should include only those that grow outdoors in summer and require little heat in winter, for vines, certainly at the beginning of their lives, should not be subjected to very high temperatures.

Different varieties of grape require rather different temperatures, but in general the temperature in January should be restricted to a range of 50 to 55° F. (10 to 13° C.). In March the minimum temperature should be raised to 55° F. (13° C.), and from April onward the day temperature should be 70 to 75° F. (21 to 24° C.), dropping to 55° F. (13° C.) at night. When the vines are in bloom the night temperature should not be less than 60° F. (16° C.), although Muscats





#### BUTCHER'S DISEASE RESISTER

This cucumber has been developed to resist cucumber spot disease. If the disease is prevalent, this is the variety to grow since there is no known control for the disease

will need a temperature of 70° F. (21° C.).

Once the grapes have coloured, reduce the heat to the minimum. During the winter, after the grapes have been picked, the vines will not be harmed if they are exposed to frost.

#### VENTILATION

A buoyant atmosphere is essential for vines. Give generous ventilation at all times, and increase ventilation if the

temperature rises. Moisture is also necessary, which means that the soil should always be damp. Spray the leaves of the vines occasionally, and damp down the floor and walls of the greenhouse in hot weather.

#### SOIL

Although vines are not particular about soil, they require excellent drainage, so always guard against the possibility of

stagnant water collecting in the borders. A clay sub-soil is ideal for vines. The border should be up to 10 ft. wide, but since this is seldom possible in a small greenhouse, it is advisable to arrange for the roots of the vine to find their way under the walls of the greenhouse and into a well-prepared border outside. A turfy loam, with the addition of some stable manure and a few broken bricks, makes a suitable soil.

#### PLANTING

Although vines can be propagated from buds or cuttings, the beginner is advised to buy prepared canes in pots. Wash the roots free from soil so that they can easily be spread out in the new bed, trim the canes back to about 1½ ft., and plant them in January, 3 to 4 ft. apart. Be sure to fill in plenty of soil among the roots, and tread the plants in well.

#### WATERING

Apart from keeping the soil evenly moist at all times, vines need thorough watering during specific periods of their development. Water well when the vine is starting to grow vigorously, just before flowering, when the fruit is setting and again when it is swelling, and finally after the grapes have been harvested.

#### TRAINING AND PRUNING

Training and pruning a vine is an extremely important operation, but is not difficult. During the first year, the vine will bear no grapes, and only the main shoot should be allowed to grow to its full length. Stop side shoots when they reach 2 ft., and cut them back completely when pruning in the winter.

A few bunches of grapes may be produced during the second year, for the side shoots are now allowed to develop naturally. In the winter, however, prune them back to one bud from the main stem, leaving the most vigorous spur. The main shoot, too, should be pruned

back to the hard, ripe wood, probably about 6 to 8 ft. from the ground. As it needs support tie the vine to wires stretched the length of the house 1 ft. from the glass walls or roof. Gently bend down the laterals before they touch the glass, and tie these to the wires too. Make sure that they are evenly distributed over the available space and receive the maximum amount of light and air.

In the third year, the vine will produce a full crop of grapes, and should continue to yield fruit for many years. Restrict each lateral by nipping it off at two leaves beyond the first bunch of grapes. After the fruit has been harvested, cut each lateral to half its length, and in the winter, prune to one bud from the main stem. The main shoot, too, should now be stopped at the top wire of the house, to encourage fruit-bearing shoots to break lower down.

If only one vine is grown in the greenhouse, keep two main shoots during the first year, and train them horizontally in opposite directions. The laterals that grow from the upper sides of these shoots should be trained vertically. The subsequent treatment is the same as that described above.

#### THINNING

Never allow more than one bunch of grapes to develop on each lateral, and remove any others as soon as possible. As a general rule, each foot of well-matured vine should carry no more than 1 lb. of fruit. It may therefore become necessary to carry out further thinning.

In the case of some heavy-berried vines, the top two or three bunches may need to be supported by looping raffia to the wires.

A good bunch of grapes has a compact appearance, and should not be allowed to become too long or straggling. The individual grapes in a bunch may therefore need thinning, particularly at the

centre, otherwise those grapes will become flattened. Never touch the fruit by hand, but hold the bunch steady with a short, forked stick and use special grape-thinning scissors.

#### VARIETIES

The following varieties are recommended for cultivation under glass:

##### *Black*

Black Hamburgh, May to November; very productive, excellent flavour.

Lady Downes, December; keeps well.

##### *White*

Cannon Hall Muscat, December; good flavour.

Muscat of Alexandria, May to December; excellent flavour.

### MELONS

Melons can be grown either in the greenhouse or in frames, but the ideal conditions for their cultivation can best be achieved in a greenhouse. They require rather similar treatment to cucumbers, to which they are related, but it is important to remember that, after the earliest stages, melons like a drier atmosphere than cucumbers.

#### SOWING IN POTS

A good fibrous loam is essential for melons, and it is therefore advisable to add one part leaf mould and sand to three parts loam; the addition of a few smashed crocks will also be beneficial. In March, sow the melon seed about  $\frac{1}{4}$  in. deep in individual small pots. Water well, particularly if the weather is hot, and plunge the pots up to their rims in moist peat to encourage germination. Keep the peat moist and provide plenty of light. Do not let the night temperature fall below 65° F. (18° C.) at this stage.

#### POTTING ON

It is important that the young melon plants should not become starved, and

they should therefore be potted on into 5-in. pots before they have completely filled the smaller pots with roots. The temperature may now be reduced to 60° F. (16° C.) at night, but do not allow it to fall any lower from now on.

#### PLANTING OUT

A good fibrous loam is the best soil for the planting bed, as for the pots. Make up the bed with small mounds, as for cucumbers, and plant in the same way. Do not ram down the soil too firmly, however, and do not leave a depression for water at the top of each mound. The soil round the base of melon stems should never be allowed to be too moist.

#### TRAINING AND STOPPING

Provide wires for training melons in the same way as for cucumbers. Stake and tie the plants as this becomes necessary. Train melons up canes until they reach the top wires of the greenhouse; only then should the tips be pinched out. Side shoots will then soon appear, which in turn will bear male and female flowers.

#### FERTILIZATION

Unlike cucumbers, melons must be fertilized if they are to produce fruit. Wait until about six female flowers have appeared on each plant; these can be identified by the tiny embryo melon at the base of the flower. Break off the petals of the same number of male flowers without disturbing the pollen, and place each one over a female flower, so that the stigmas receive the pollen. This operation is best carried out at about midday, when the female flowers are most receptive. The melons will swell quickly after fertilization, but do not allow more than three or four fruits to develop on one plant, and not more than one on each side shoot.

#### WATERING AND FEEDING

Keep the soil fairly dry during the period of fertilization, but water thoroughly



compost, and sow three seeds  $\frac{1}{4}$  in. apart and  $\frac{1}{4}$  in. deep in the centre of each pot. Place the pots in the frame, and when the seedlings appear, thin them down to one to each pot.

They should then be left in the frame until the end of May, when they should be ready for planting out in the garden.

#### POTTING UP

After about 28 days the seedlings that are in boxes in the greenhouse should be about  $1\frac{1}{2}$  in. high, with two pairs of true leaves. Each seedling should then be potted off into a 3-in. pot, using John Innes potting compost No. 1. Always handle the plants by the leaves, never by the stems.

At the beginning of May plants that are to mature out-of-doors should be placed, in their pots, in cold frames to harden. By the third week of May the glass of the frames may be removed, and the plants should be ready for planting out in the garden at the end of May or early in June.

Plants that are to continue growing in the greenhouse may either be planted out in the border, potted on into larger pots or boxes, or cultivated in rings on beds of aggregate.

#### PLANTING OUT IN THE BORDER

The ideal soil for tomatoes grown in the border of the greenhouse is a friable, well-drained, but firm, sandy loam. Dig in 4 oz. of fish manure per sq. yd., and spread 1 lb. of lime per 100 sq. yds. on the surface of the soil. To improve aeration in soil that is heavy, or which has held tomatoes for several years, dig straw into the ground, or use a bucketful of coarse peat per sq. yd.

When the young plants are about 5 or 6 in. high, turn them out of their 3-in. pots, carefully keeping the ball of soil intact and removing only the crotch. Most varieties can be planted 15 in. apart

in rows that are alternately 1 ft. 9 in. and 2 ft. 3 in. apart. With proper treatment each plant should yield an average crop of 6 to 8 lb.

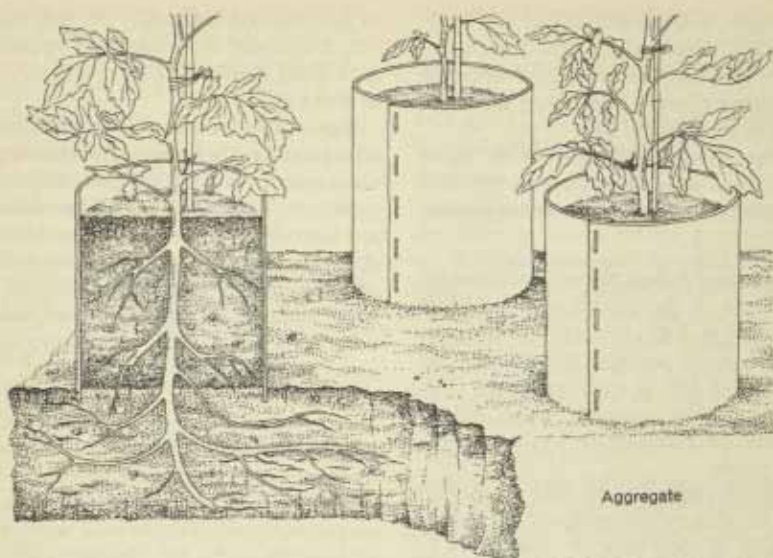
Water the plants in well immediately after planting. Thereafter, a good soaking once or twice a week will generally be sufficient. It is difficult to lay down hard and fast rules, however, and the gardener should be guided by the appearance of his plants as well as by atmospheric conditions. If the leaves flag, it is a sign that water is needed; a light sprinkling of water over the leaves is also beneficial.

Do not be tempted to over-feed with manure during the growing season, as this may result in the dropping of the flowers, watery and insipid flavour, and disease because the plant is soft. Top dressings of peat or straw may be given as a mulch, and a fish fertilizer with a 10 per cent potash content may be applied in July, August and September, using about 2 oz. per sq. yd. Watering with Liquinure (Tomato Special) is also an excellent method of feeding tomatoes in summer; use once a fortnight, following the instructions on the bottle.

#### GROWING ON IN BOXES OR POTS

Plants that are to mature in boxes or pots should be grown for about three weeks in their 3-in. pots and then transferred to 5-in. pots for a similar period. Meanwhile, fill 10-in. pots or boxes with a compost of two parts good soil to one part peat, filling to within about 4 in. of the top, so that top dressings can be added later. Leave the compost to warm for some time before planting, and then dig a hole large enough to hold intact the ball of soil from the smaller pot, so that the root system is disturbed as little as possible when the plant is moved.

Give a top dressing of 2 to 4 in. of John Innes potting compost No. 2 when several trusses of fruit have set. Another dressing may be necessary six weeks later; water



## RING CULTURE OF TOMATOES

This method saves labour, promotes steady growth and helps the plants to escape soil-borne diseases. In May set the plants in compost-filled, open-ended rings of roofing felt or lino and place the rings 1½ ft. apart on moist aggregate

well after each dressing to settle the soil. Pot plants require more watering and manuring than plants in the border, and it will usually be necessary to water every day, adding a suitable liquid feed to the water twice a week.

## RING CULTURE

This method indicates the growing of tomato plants in open-ended pots, which stand on beds of moist aggregate. The plants form their first root system in the pots, where they obtain their food, and a secondary root system in the aggregate, from which they receive moisture. Ring culture is labour saving, and has the added advantages of promoting steady growth, earlier cropping and greater freedom from soil diseases.

To make a bed of aggregate, dig a trough or excavate the floor of the greenhouse to a depth of 6 in. Line the

sides of the excavation with slate or polythene to prevent the soil from washing in. In the case of clay soil, which does not drain freely, slope each side of the base of the excavation towards the centre, and give the trough a very slight overall incline. Cover the base with a polythene sheet, and place drain-pipes down the centre, leading to a rubble-filled hole outside the greenhouse. Then fill the trough with aggregate.

The best aggregate is weathered boiler ash, which can be kept moist. Alternatively, use fine weathered clinker or a mixture of three parts ½-in. gravel and one part coarse grade vermiculite.

Wash the aggregate with a 2 per cent formalin solution each year, and close the greenhouse for several days. It should then be ventilated until all the fumes have disappeared.

For a double row of tomato plants, make a bed 3 ft. wide, or for a single row, 1 ft. wide, pressing down the aggregate well and then soaking it with water.

Make bottomless pots for the tomato plants from rings of roofing felt or lino 9 in. deep and 9 in. in diameter. The simplest nutrient compost is the John Innes potting compost No. 3, or Eclipse No-Soil compost, a bushel of which will fill five 9-in. pots. Good results can also be obtained from three parts heavy loam and one part peat (both by bulk), adding 12 oz. John Innes base fertilizer and 4 oz. ground chalk.

At the end of April or in May, stand each ring on a slate, and half fill it with compost, pressing this fairly firm with a piece of wood. Set a plant, which should be showing its first truss of flowers, in the ring, and pack compost round it to within 1 in. of the top of the ring. Place the pots on the aggregate, leaving 1½ ft. between each; pack a little aggregate between them.

Keep the aggregate moist by frequent watering, but do not flood it, for the plants should receive only a little water until the first flowers have set, so that roots develop downward into the aggregate before growing in the compost. Water the pots only when the ball of soil dries out, and if they are splashed from the daily watering of the aggregate, it is not necessary to water them separately.

Start feeding with a liquid fertilizer when the first truss of flowers has set and the fruit is beginning to swell.

Frequent feeding gives the best results, and should be confined entirely to the pots. Give about one pint per plant every third or fourth day, and water the aggregate afterwards.

#### STOPPING AND STAKING

Whichever method is used for growing greenhouse tomatoes, all side shoots

should be pinched out immediately they appear, and dense foliage may be thinned to allow air and sunlight to reach the fruit.

Avoid any ruthless cutting away of the leaves, though any yellowing leaves may be removed.

Stop each plant by pinching out the growing point when it has produced nine or ten trusses of flowers.

All tomato plants need support. Bamboo canes can be used, or lengths of string can be attached to overhead wires strung tightly from one end of the greenhouse to the other, about 6 ft. from the ground. Tie the other end of each string to the base of a plant, or to a short bamboo cane driven in near its base, and twist the string round the plant as it grows and needs support.

#### VARIETIES

The following varieties of tomato are recommended for cultivation under glass:

All Clear, a good cropper, fairly resistant to mildew.

E.S.5, a tall, heavy cropping variety, with fruit of excellent quality.

Eurocross, a hybrid which is resistant to tomato mould disease; a heavy early cropper.

Market King, a heavy cropper, good flavour.

Syston Cross, a free-setting, short-jointed variety, immune from tomato mould disease; easy to grow.

#### DECORATIVE PLANTS

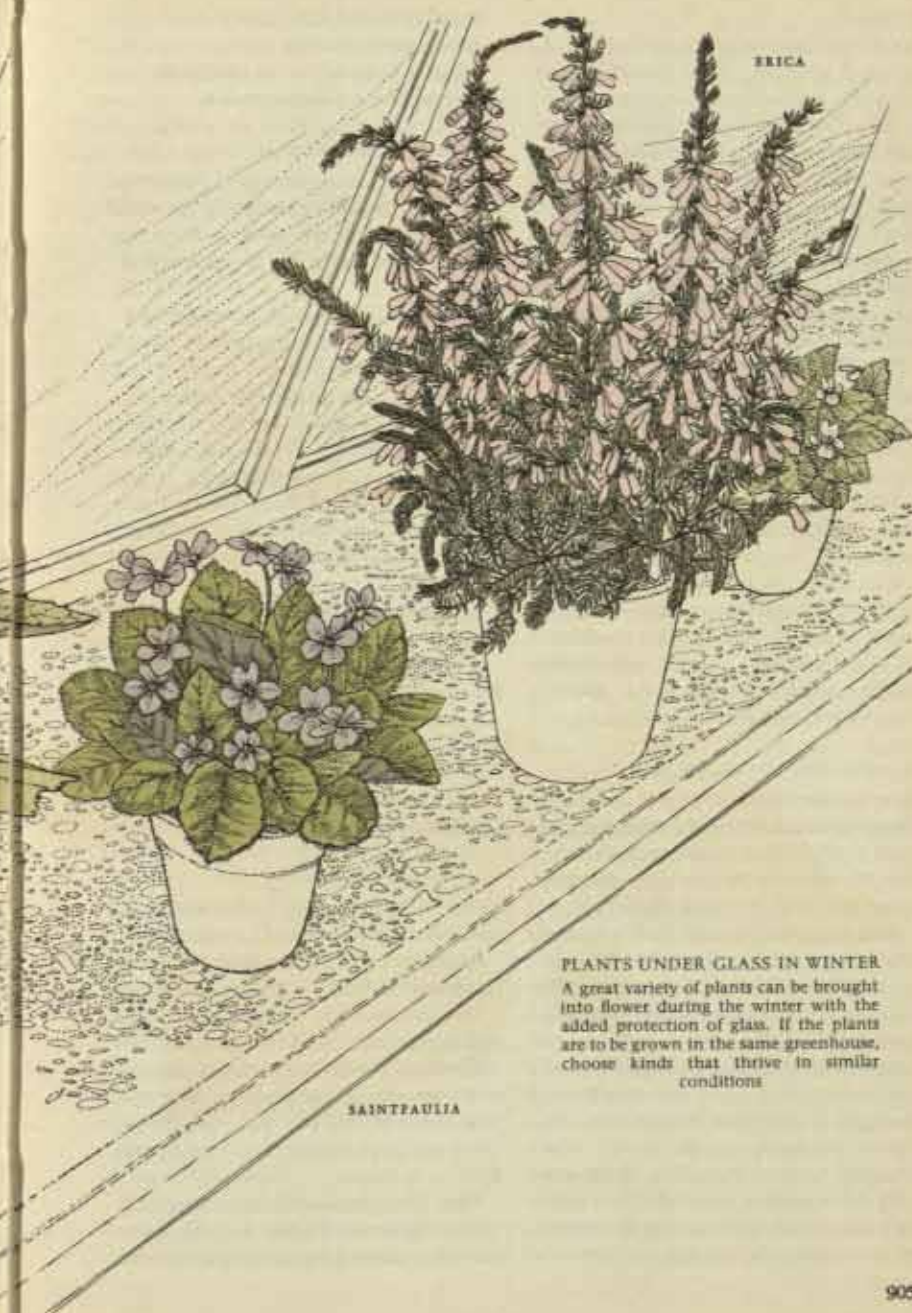
There are a great many decorative plants that can be grown under glass, but the gardener who has only one greenhouse should choose plants that thrive in similar conditions.

A recommended average temperature is a steady 55° F. (13° C.) in the daytime and 45° F. (7° C.) at night.





CINERARIA



ERICA

SAINTPAULIA

**PLANTS UNDER GLASS IN WINTER**  
A great variety of plants can be brought into flower during the winter with the added protection of glass. If the plants are to be grown in the same greenhouse, choose kinds that thrive in similar conditions.



## WATERING

Plants that have large broad leaves and are quick growing often require water every day, while plants that grow slowly or have thick leathery leaves may not need watering more than once a week. Plants that are growing fast and are healthy need more water than sickly plants, or those that have been cut back or are starting to flower. A plant growing in a peaty compost requires less water than one in a sandy compost. Less water is needed in winter than in summer.

The following are some of the flowers that are successfully grown under glass. (See also *Carnations* and *Chrysanthemums*.)

## BEGONIAS

Tuberous-rooted begonias are generally more popular than the fibrous-rooted varieties, for they produce large single or double flowers in various shades of red, orange, yellow, pink and white. Fibrous-rooted begonias produce larger plants, but the individual flowers are much smaller. Many fibrous-rooted species have attractive ornamental foliage.

## TUBEROUS-ROOTED BEGONIAS

These flower in summer and autumn. The greenhouse should be shaded from direct sunlight and have a temperature of 65° F. (18° C.) during the growing season and 45° F. (7° C.) in the winter.

In March, plant the tubers in boxes in damp peat or leaf mould so that they are only half buried. When they are rooted, and have produced shoots  $\frac{1}{2}$  in. long, pot them into 6-in. pots in a compost of 3 parts fibrous loam, 1 part leaf mould and 1 part well-decayed manure. Water sparingly at first, but freely once the plants are growing strongly. After flowering, reduce watering gradually until the tops have dried off. Then turn the pots on their sides, so that the tubers dry out during the winter.

Recommended varieties are:

Victor Boret, orange.

Princess Victoria Louise, pale pink.

Evelyn Tavenat, salmon-pink.

## FIBROUS-ROOTED BEGONIAS

These flower in autumn and early spring. They are usually propagated by leaf cuttings taken in spring or summer, or by shoot cuttings taken in February or March.

Shade the greenhouse from the sun, and maintain a temperature of about 60° F. (16° C.) in spring and summer and 50° F. (10° C.) in autumn and winter.

Keep the plants moist in the early stages and syringe them daily. Water sparingly in the autumn, and when flowering is over, reduce watering still further. Keep the plants fairly dry until March, when they may be repotted into 6-in. pots.

Recommended are:

*Begonia fuchsioides*, 3-ft., scarlet flowers.

*B. Gloire de Lorraine*, 2-ft., light pink flowers.

*B. imperialis*, a short, creeping plant, with velvety, bright green leaves, white flowers.

*B. rex*, 4-ft., silver and purple foliage, pale pink flowers.

## CINERARIA

Plants with fairly large leaves and large heads of daisy-like flowers in white, pink, red, mauve or blue, which bloom from December to May.

Sow the seed any time between April and July in John Innes seed compost at a temperature of 65° F. (18° C.). When the seedlings appear, pot them off into 3-in. pots and later into 6-in. pots, using John Innes potting compost No. 2 or Eclipse No-Soil compost.

Place the pots in a cold frame from July until early October, when they should be moved to the staging of the greenhouse.

Shade them from strong sunlight, and maintain a temperature of 55° F. (13° C.). Feed the plants twice a week from September onward with diluted Liquinure. Always keep the soil in the pots moist, but do not over-water.

#### VARIETIES

Recommended large-flowered varieties are:

Brilliant Ruby  
Pink Pearl  
Royal Blue

Recommended small-flowered varieties are:

King, rosy-carmine  
Sky Blue  
White Star

#### CYCLAMEN

A perennial that produces flowers of white or various shades of pink, cerise, crimson or salmon-scarlet during the winter. The foliage is often marbled.

Sow seeds  $\frac{1}{4}$  in. deep in John Innes seed compost any time between August and November, or between January and March, at a temperature of 55° F. (13° C.). When the seedlings are about 1 in. high, pot them into 3-in. pots, containing John Innes potting compost No. 1 or Eclipse No-Soil compost, to continue growing at a temperature of 50° F. (10° C.) on the greenhouse staging. During the summer the pots may be placed outside in a cold frame, shaded from direct sunlight. Move them back to the greenhouse and a temperature of 50° F. (10° C.) at the end of September.

When in flower, feed cyclamen with diluted Liquinure once a week. After the flowers die, keep the corms almost dry from May to July, and repot them in August, leaving the tips just above the surface of the soil.

Syringe every few days until new growth appears, and then water daily until the plants cease to flower.

#### ERICAS

Ericas, or heaths, are small shrubby plants bearing white, pink or mauve flowers from late November to August according to species.

The most commonly grown is *Erica hyemalis* from South Africa, which produces white flowers flushed with rose-pink from November to February. This erica is a lime-hater and should be given a peaty-sandy compost and watered with soft water. Maintain a temperature of 45 to 55° F. (7 to 13° C.).

#### GLOXINIA

Plants with tuberous roots and huge, bell-shaped flowers of pink, crimson, purple, lilac or white, which bloom in the autumn.

Sow seeds in John Innes seed compost in March, and when the seedlings are 1 in. high, pot them into 3-in. pots, using John Innes potting compost No. 1. The pots should have good drainage, and should stand in a shady part of the greenhouse as near as possible to the glass. The temperature from January to October should be 65° F. (18° C.), and from October to January 50° F. (10° C.). Feed once a week with diluted Liquinure as soon as the buds appear, and cease feeding when flowering is over.

If gloxinias are raised from tubers, pot these up singly into 3-in. pots any time between the middle of January and the end of March. Do not completely bury the tubers, and press the soil fairly firm. When the tubers are growing well, pot them up into 6-in. pots, using John Innes potting compost No. 2. Give only a little water in the early stages of growth, but when the leaves are larger and the plants are growing vigorously, water more freely. When flowering is over, reduce watering until the leaves die off, and then keep the tubers dry until the following spring.

TUBEROUS-ROOTED BEGONIA



This type of begonia should be shaded from direct sun in a temperature of 65° F. (18° C.) in the growing season, and 45° F. (7° C.) in the winter

Recommended varieties are:

- Fire King, pale crimson.
- Lord Roseberry, purple.
- Petunia, lilac.

PELARGONIUM

Zonal and ivy-leaved pelargoniums are known as geraniums; both these and a third type, show, grow well in pots. The leaves are green or variegated, and the flowers grow on firm stems.

SHOW PELARGONIUMS

These flower in spring and early summer. Stand pots near the glass of the house, in a temperature of 45° F. (7° C.) from September to March, and 50° F. (10° C.) from March until the end of May. After flowering, place the pots outside in the sun until the end of September.

Take cuttings of firm ripe shoots 3 in. long in July or August and root them in a mixture of sand and peat in a cold



PRIMULA MALACOIDES

Primulas should be kept in a shady corner at a temperature of 30° F. (10° C.) in the growing season, and 35° F. (13° C.) in the flowering season

PRIMULA OBCONICA



frame. When the cuttings have rooted, pot them into 3-in. pots in John Innes potting compost No. 1 and after a month pinch back about 1 in. of the growing point of each plant to encourage bushy growth. Pot up into 6-in. pots early in September, and repot old plants at the same time. Water freely from March until June and moderately at other times.

Recommended varieties are:

Chelsea Gem, pink flowers, silver leaves.

Happy Thought, crimson flowers, dark green leaves with gold butterfly markings.

H. Cox, rose flowers, pale gold leaves marked with purple, red or cream.

Hills of Snow, purple flowers, creamy leaves with white markings.

#### ZONAL PELARGONIUMS

These flower at almost all seasons, but should be shaded from the sun when in full bloom. The winter-flowering types will thrive in a sunny cold frame from June to September, and when returned to the greenhouse will need a temperature of 50° F. (10° C.) until the following March. For summer-flowering plants, maintain a greenhouse temperature of 40° F. (4° C.) from August to March, and 55° F. (13° C.) from March till May.

Take cuttings of zonal pelargoniums in late summer. When these have rooted, pot them up into 3-in. pots, and later into 6-in. pots. Feed with Liquinure twice a week when the plants are well established. At the end of the season prune back the old plants quite severely.

Recommended varieties are:

Barbara Hope, carmine.

Caledonia, purple.

Drummer Boy, vermilion.

Hope, turkey-red.

Mrs. S. J. Ward, rose.

Prince of Wales, Tyrian purple.

Willingdon Gem, mandarin-red with a white eye.

#### IVY-LEAVED PELARGONIUMS

These flower in the summer and are propagated by cuttings taken in August or September. When the cuttings have rooted, put them into 3-in. pots, using John Innes potting compost No. 1. Cut back the plants in February or March and repot them when necessary into 6-in. pots. When the plants are well established in 6-in. pots, feed twice a week with diluted Liquinure. Water freely during the summer but moderately at other times.

The temperature of the greenhouse should be 50° F. (10° C.) from March to September, and 40° F. (4° C.) from September to March.

Ivy-leaved pelargoniums look well in hanging baskets or urns, or trained up trellises, and they also make a good cover for banks or high walls. They are not completely hardy, however, and should be moved back to the greenhouse in late September.

Recommended varieties are:

Galilee, double pink.

La France, imperial purple.

Lilac Gem, pale mauve.

Millfield Gem, a hybrid, rose-blotched and feathered with rosy-red.

Neon, vivid cerise.

The Duchess, white and Tyrian purple.

#### PRIMULAS

Many kinds of primula can be grown successfully in a greenhouse, and most of them flower in the winter and spring.

Sow the seed in March or April in John Innes seed compost, and when the seedlings are 1 in. high, pot them up into 3-in. pots, using John Innes potting compost No. 1. Always pot primulas firmly and a little more deeply than other plants. Roots often form from the base of the lower leaves, helping to give extra support to the plants, which otherwise tend to be top-heavy.

Primulas may be brought into flower in their 3-in. pots, or they may be potted up into 6-in. pots. Keep the pots in a shady corner of the greenhouse at a temperature of 50° F. (10° C.) during the growing season, and 35° F. (13° C.) during the flowering season. Give plenty of ventilation.

Feed the plants once a week when the compost is full of roots, but stop feeding when the flowers start to open. Keep the compost just moist; never over-water, or the leaves will turn yellow.

Some hairy-leaved primulas, particularly *Primula obconica*, may cause eczema or primula rash to break out on the hands and forearms, and those who are allergic to these plants are advised to wear gloves when handling them.

Recommended are:

*Primula obconica*, large flowers in shades of pink and mauve in winter.

*P. malacoides*, the fairy primrose, bears dainty flowers of lilac, pink, rose or white, in tiers round fairly tall stems. May be brought into bloom at almost any time by sowing the seeds at different times.

## ROSES

Roses grown in pots in a cold greenhouse reveal a pristine beauty that is rarely, if ever, seen outside. Both blooms and foliage attain a perfection that is virtually impossible in the open, where the roses are always at the mercy of the elements. In a cold greenhouse the first flowers usually appear about a month earlier than those outside.

The greenhouse should have a winter temperature of about 45° F. (7° C.) at night, and at no time should the temperature rise above about 60° F. (16° C.).

### FIRST SEASON

In October, prepare 10-in. pots by placing crocks in the bottom to facilitate drainage, and charcoal to sweeten the planting

mixture. Follow this with a compost of three parts moderately heavy loam and one part well-rotted manure, and add two handfuls of bone meal. Then dig up trees of the chosen variety, or buy them from a nursery. Trim the roots so that they can spread comfortably in the pot, and plant the roses so that the soil level when pressed down firmly is not less than 2 in. below the top of the pot.

Stand the pots in a sheltered corner out-of-doors; shorten any extra long stems to prevent the bushes from blowing about and loosening in their pots before the roots are firmly established.

Bring the pots into the greenhouse in December, and keep them bone dry until the foliage has dropped off, usually in two to three weeks. Then prune really drastically to only two buds from the base of each main stem. Failure to do this will result in thin growth and mediocre flowers.

### WATERING AND FEEDING

Water thoroughly after pruning, but give no more water until fresh growth appears. Then water once a week, and when the roses are growing well, more frequently still; never let the pots dry out. If in doubt, rap the side of the pot with a wooden hammer or with the knuckles; a dull sound means that the soil is still damp, and a hollow ring indicates that watering is essential. Remember that a cracked pot always produces a dull sound.

Feed with a proprietary fertilizer from the end of March, following the manufacturer's directions. The frequency of feeding will depend on the progress of each plant, but every seven to ten days is usually sufficient. After the first flowering has ended, transfer the pots outside and water occasionally during dry spells. Re-house the trees in December, after first removing the top inch or

so of potting mixture and replacing it with fresh similar material. The first year's treatment can then be repeated.

#### PESTS AND DISEASES

For the treatment of mildew, aphids, thrips and caterpillars see *Roses*.

Another potential pest for the greenhouse rose is red spider. Leaves attacked by red spider mite assume a mottled, yellowish appearance on the underside, and fall prematurely. Liquid derris gives some control, but current literature from leading insecticide manufacturers should be consulted for the most up-to-date treatment.

#### VARIETIES

The following varieties are reliable for large, specimen blooms under glass:

- Christian Dior, crimson.
- Eden Rose, deep pink.
- Ethel Sanday, yellow and apricot.
- Gail Borden, light pink and pale yellow.
- Margaret, light pink.
- Montezuma, salmon-red.
- My Choice, salmon-pink and buff-yellow.

- Paris Match, deep pink.
- Peace, yellow and cream.
- Pink Favourite, deep pink.
- Prima Ballerina, deep pink.
- Silver Lining, light pink.

Medium-sized, decorative blooms are:

Baccara, deep vermilion, grows far better in the greenhouse than in the garden.

- Lady Sylvia, flesh-pink.
- Lilac Time, lilac.
- Message, white.
- Mrs. Sam McGredy, scarlet and orange.
- Spek's Yellow, deep yellow.
- Super Star, vermilion.
- Wendy Cussons, deep pink.

Floribundas include:

- Anna Wheatcroft, rosy-salmon.
- Celebration, light salmon.
- Chanelle, buff-pink.
- Dickson's Flame, scarlet.
- Elsinore, red.
- Flamenco, deep pink.
- Highlight, orange-scarlet.
- Meteor, scarlet.
- Orangeade, scarlet.
- Sherry, brownish-red.



# Electricity in the Garden

MANY gardening jobs that are time-consuming and laborious if done by hand can be done quickly and efficiently by electricity, thus enabling the gardener to undertake interesting tasks that otherwise could not be attempted at all.

As a means of heating, electricity can be used in greenhouses and frames for producing early crops and bringing plants through the rigours of an unpredictable winter. The thermostat stands as an automatic guard against a sudden drop in temperature at any time of day or night, thus making the greenhouse a practical possibility where the gardener could not spare the time to keep the temperature constant by other methods.

Used for power, electricity will quickly and efficiently mow the lawn, cut the hedge, pump the water for a stream, and take a lot of the hard work out of cultivating the soil. And for those who garden on a large scale, it can saw logs and provide power spraying and irrigation.

As a source of light, it can be used to supplement daylight during the dark days of winter, to speed up—or retard—the growth of certain plants, or to replace daylight completely for raising plants in solid buildings.

*But the important thing to remember is that however electricity is used in the garden, all electrical connections should be properly installed by an experienced electrician and not attempted by the do-it-yourself handyman. Using electricity in the garden has particular safety hazards because of the dampness that is present.*

## HEATING

### SOIL WARMING

Electricity can be used to provide bottom heat economically and efficiently on greenhouse benches and borders and in propagating- and garden-frames. To produce early vegetables in the garden-frame it has proved an efficient, if not complete, replacement of the manure hot-bed, the use of which is diminishing as manure becomes more difficult to obtain.

Soil warming cannot replace the contribution to fertility made by the manure imported for hot-beds, but it can effectively replace it as a source of heat for producing early lettuces, carrots, turnips, radishes and cauliflowers.

### SOIL-WARMING EQUIPMENT

There are two distinct types of soil-warming equipment—low voltage and mains voltage.

A low-voltage system consists of a small transformer and a length of galvanized iron wire, which may be plastic covered. The gauge and length of the wire will be calculated to give a known electrical resistance and should not be shortened or replaced by any other piece of wire.

Mains voltage equipment consists of a central resistance wire covered with insulation and, in some cases, protected by a metal sheath. It is connected direct to the mains and runs at mains voltage like any other piece of electrical equipment.

Whichever system is used, the results and running costs are the same. The initial cost of the low-voltage system is



higher, but it is slightly safer if a spade or fork is likely to be used.

#### HOT-BEDS

The most profitable way to use a garden-frame is as a hot-bed for producing early salads and vegetables while they are scarce and expensive to buy. Melons or cucumbers may be grown in it after the early salads and vegetables have been harvested, or quick-maturing turnips such as Early Snowball may be sown.

Almost any type of frame can be used, but obviously the better it is constructed the more efficient it will be. The two most popular types are the 6 by 4 ft. English light frame, and the two-light Dutch light frame. Both these cover about the same area, but Dutch lights are easier to manipulate than the heavy English lights.

Thus the use of electricity transforms the ordinary garden-frame into a miniature greenhouse. It lacks headroom, of course, but even this limitation is turned to advantage by making it very economical on fuel. The actual running costs will vary according to the temperature maintained, but an average frame will use about 1½ units of electricity a day.

To construct a hot-bed the wire or cable is laid in the frame and covered with 6 in. of soil. Lay the wire so that it covers the area as evenly as possible, giving an electrical loading of 6 watts per sq. ft. To find the loading required, the area of the frame is multiplied by 6. So for a 6 by 4 ft. frame, which, of course, has an area of 24 sq. ft., the loading would be 144 watts. Thus a 150-watt soil-warming cable or transformer would be suitable.

With a loading of 6 watts per sq. ft., 10 hours of warming each night would be sufficient in the south of the British Isles, but in the north 12 hours would be required. A time-switch can be fitted which will do away with the need to switch the unit on and off each day.

#### PROPAGATING-FRAME

Many plants can be propagated in a soil-warmed frame when the early salad crops are finished. Remove the soil down to the wires and replace it with a 2- to 3-in. layer of sharp sand which will conduct warmth to the pots and boxes of seedlings and cuttings. Most of the half-hardy annuals, and vegetable seedlings such as celery, leeks, cauliflowers and lettuce, can all be raised in this way. So can tomatoes, marrows, melons and a host of others. To give them an extra boost during germination, leave the current on the whole 24 hours instead of switching off each morning, and cover the frame with a mat each night to conserve the heat.

Air warming will broaden the scope of the frame and increase its usefulness considerably. Mains voltage, plastic-covered soil-warming cable, fixed round the inside of the frame on porcelain or plastic cleats, is usually used for such an installation. Copper-covered, mineral-insulated cable can also be used, and makes a neat, robust, effective installation which should give many years of trouble-free service. To conserve heat a frame must be well constructed and air-tight; during very cold weather, loosely-filled sacks of straw placed round the outside of the frame will help to keep in the heat.

In the interests of economy, air warming should be controlled by a thermostat which will switch off the current as soon as the inside of the frame reaches the required temperature. For an average frame with brick sides, or timber an inch or more in thickness, the electrical loading required will be 15 watts for every square foot of glass. For a 6 by 4 ft. frame, the loading will be 360 watts; a 300- or 350-watt soil-warming cable would be suitable.

#### SOIL-WARMED GREENHOUSE BORDERS

The low-voltage system is usually used for this purpose, the wires being laid 9 in.

deep. The electrical loading can be from 5 to 8 watts per sq. ft., which means that a 100-watt transformer will be capable of warming up to 20 sq. ft. of border. As soil retains the heat well, it is usually sufficient to have the current on for only 12 hours out of each 24.

#### SOIL-WARMED GREENHOUSE BENCHES

These are constructed by placing 2-in. layers of sand on the benches, laying the cables on this and covering with a further 2 in. of sand. Mains voltage cables are ideal for this purpose, the electrical loading usually being from 5 to 8 watts per sq. ft.

To convert an ordinary slatted bench, fix 6-in. deep boards round the sides and cover the slats with a layer of roofing felt. Place the pots and boxes of cuttings and seedlings on the surface of the sand and pack the spaces between the pots with moist peat to retain the heat. The heating wires raise the temperature of the sand and this heat is in turn transmitted to the pots and boxes. Control the temperature of the sand at 60° F. (15° C.) by placing a rod-type thermostat at right angles across the bench with the rod just below the surface of the sand. Alternatively, it can be hand switched when a soil thermometer placed under one of the boxes indicates the need.

#### PROPAGATING CASES

To take the warm bench a stage further, a propagating case can be built over it. This can then be improved still further by fitting soil-warming cables round the inside of the case to provide air warming, making, in effect, a heated greenhouse within a greenhouse to provide correct conditions for germinating seeds and rooting cuttings. In a heated house this can effect a considerable saving in fuel as a temperature of 60 to 65° F. (15 to 18° C.) can be maintained quite economically within the case, while the general space

temperature is kept down to 45 to 50° F. (7 to 10° C.).

#### GREENHOUSE HEATING

For heating a small greenhouse, electricity has a decided advantage over other fuels. It is efficient, reliable, clean, economic and, most important, it is automatic and needs no attention. There are numerous methods of heating a greenhouse electrically, and the running costs are about the same in each case.

A heating system should replace the heat lost through the fabric of the greenhouse even in the severest weather; to determine the size of the heater required, it will be necessary to calculate that loss. Heating for a greenhouse should be based on a minimum outside temperature of 20° F. (-5° C.). So if the greenhouse is to be maintained at a minimum temperature of 45° F. (7° C.), the heating system will have to be capable of raising the temperature by 25° F.

For an accurate calculation it is necessary to know the thermal conductivity figure, or "U" value of the various materials used in the construction of the greenhouse, which are as follows:

Horticultural glass	1.0
Woodwork 1 in. thick	0.5
Woodwork 1½ in. thick	0.4
Brickwork 4½ in. thick	0.6
Brickwork 9 in. thick	0.5
Floor soil or concrete	0.33

The calculation is made in three stages:

1. Measure the surface area of the glass (including the sash bars), brickwork, soil, etc., of the greenhouse. Multiply each area by the appropriate "U" value, then add up the total.
2. Multiply the total by 0.39. (This figure takes into account the factor for fortuitous losses—1.33, and the fact that there are 3.412 B.T.U.s (British Thermal Units) in a watt, viz. 1.33 divided by 3.412 = 0.39.)
3. Multiply the result of this by the

## HOW MUCH HEAT IS REQUIRED?

To work out the heat required in a greenhouse, surface areas of the structure have to be measured, and the "U" values of the materials allowed for. The following calculation is for a typical span-roof house with a 4½-in. brick wall, and is to maintain a temperature of 45° F. (7° C.) inside, against 20° F. (-5° C.) outside.

	Area (sq. ft.)	"U" value from table	Heat loss B.T.U./Hr./°F.
Glass roof 12 ft. × 4 ft. 6 in. × 2	108	× 1	108
Glass sides 12 ft. × 3 ft. × 2	72	× 1	72
Glass ends 8 ft. × 3 ft. × 2	48	× 1	48
4 ft. × 2 ft. × 2	16		16
Brick sides 12 ft. × 2 ft. × 2	48	× 0.6	29
Brick ends (including door)			
8 ft. × 2 ft. × 2	32	× 0.6	19
Soil 8 ft. × 12 ft.	96	× 0.33	32
			<u>324</u>
Multiply 324 × 0.39 = 126 watts per °F. rise Multiply by "temperature lift" 25° F. = 126 × 25 = 3,150 watts Choose the next standard-size heater above 3,150 watts—3½ kW.			

"temperature lift" (the difference between the inside temperature to be maintained and the 20° F. outside temperature).

## TYPES OF HEATER

The output of a heater is determined by its electrical loading. Any two heaters of the same loading will produce the same amount of heat, while consuming identical amounts of electricity, but some types distribute the heat more efficiently than others. The number of units per hour consumed by a heater is equal to the kilowattage of the heater, so that a ¾-kilowatt heater will consume ¾ units of electricity per hour.

*Tubular Heaters* are normally used in small greenhouses; there is a special waterproof, horticultural grade, available in lengths ranging from 2 to 10 ft., which should be used under greenhouse conditions. The electrical loading is usually 60 watts per foot of length.

The best place for mounting a tubular heater is low down on the side walls of the house. If this happens to be underneath a solid bench, a gap of at least 3 in. must be left between the back of the bench and the side of the house to allow a free passage of air.

*Convactor Heaters* are the most satisfactory form of portable heater. They are reasonably cheap to buy, but only the ones specially designed for the greenhouse should be used.

A convactor heater consists of a galvanized-iron cabinet containing a heating element. The air enters at the bottom, passes over the element and is warmed before being discharged at the top. Heat distribution is not quite so good as with tubular heaters. Sizes range from 500 to 3,000 watts.

*Fan-assisted Heaters* work on the same principle as convectors, but the air is forced over the element by a fan and after



being warmed circulates throughout the greenhouse.

*Fan Unit Heaters* are another type of fan-assisted heater, but the fan is mounted immediately behind the element and the air is blown out at a fairly high velocity and at a comparatively high temperature. These heaters are particularly useful in large greenhouses for providing frost protection, but the hot air could cause damage if allowed to blow directly on to the foliage of tender plants. If used in a small greenhouse, a suitable mounting point is above the door.

Fan heaters may be used in conjunction with specially-designed perforated plastic tubing which distributes the warm air throughout the house; but such installations are more suitable for the medium to large greenhouse, as 4 kilowatts is the smallest size available. Fan unit heaters are quite robust and should have a fairly long life.

#### MINERAL-INSULATED CABLES

A fairly new development for heating greenhouses is the use of copper-covered cables that are mineral-insulated—that is, insulated with magnesium oxide instead of plastic or rubber. These make a neat, attractive installation, fixed to the wall beneath the bench in the same place as the tubular heaters. This system has the advantage of being low in initial cost, but has the disadvantage of running at fairly high surface temperatures.

#### ELECTRIC WATER HEATING

An existing hot water system can be converted to electricity by fitting an immersion heater into the pipes. The solid fuel boiler is disconnected and the flow and return pipes are connected together to form a closed loop.

The cost of conversion is not high, and it is particularly useful for replacing a worn-out coke boiler where the heating pipes are still in good condition.

#### THERMOSTATIC CONTROL

Whichever type of electric heating is installed, a reliable thermostat will be essential to its economic operation, and the expenditure on a good-quality 24-in. rod-type thermostat with a waterproof head will be saved quite easily during the first winter. The thermostat should not be set too high or unnecessary electricity will be consumed. The best position for the thermostat is one-third of the way along the house from the door, mounted horizontally about 8 in. from the glass, one-third of the way down from the ridge.

#### TEMPERATURES

High night temperatures in a greenhouse are usually quite unnecessary, and for the gardener who is using his greenhouse in a general way, a night temperature of 45° F. (7° C.) will be high enough during the winter months. Consumption of fuel will depend on the temperature maintained, and if it is raised by only 5° F. the fuel consumption will be doubled. If the temperature should be raised to 60° F. (15° C.), the fuel consumption would be four times greater than it would be at 45° F.

#### GREENHOUSE VENTILATION

In addition to providing heat for the greenhouse, electricity can play a vital role in keeping it cool by controlling the ventilation. By the use of thermostatically-controlled extractor fans, ventilation of small to medium greenhouses can be entirely automatic. The fan is fitted into one end of the house, preferably as high as possible in the end opposite to the door. When the optimum temperature is exceeded the thermostat operates and the fan switches in and runs until the temperature falls by a few degrees. This, of course, is working in the reverse direction to the heating thermostat.

The following gives a rough guide to the size of fan required for 30 air changes per hour:

A 7½-in. diameter fan for houses up to 280 cu. ft. capacity.

A 9-in. diameter fan for houses up to 500 cu. ft. capacity.

A 12-in. diameter fan for houses up to 1,000 cu. ft. capacity.

For larger greenhouses, the automatic operating of traditional ventilators may be more suitable; there are now several types of equipment on the market for doing this.

#### SOIL STERILIZATION

The gardener who wishes to mix his own compost and must sterilize the loam will find an electric soil sterilizer most useful. This works by heating the soil to 180° F. (82° C.), which destroys insect pests, disease spores and weed seeds. There are several different models on the market.

#### PEST CONTROL

Pests in the greenhouse can be dealt with by means of a small thermostatically-controlled, electrically-heated unit which volatilizes insecticides, causing a continuous flow of minute particles into the atmosphere.

#### ELECTRIC POWER

By providing the energy to drive motors, electricity can do much to lighten the load of the gardener.

The electrically-driven lawn mower is an efficient, quiet machine. In the smaller cheaper models, only the cutting blades are driven by the motor and the mower still has to be pushed; the completely electric mower is propelled by the motor as well as having the cutting blades driven. Such a machine has no starting troubles, requires no engine maintenance, and will give many years of satisfactory service. There is, of course, the slight disadvantage of a trailing cable, but this can be easily overcome by working away from the power source, a simple technique which can soon be mastered.

A battery-driven mower does away with even this slight hazard. Driven at two speeds by a 12-volt battery, it will give up to three hours mowing for each charging of the battery.

#### ROUGH GRASS CUTTER

For cutting rough grass on banks and in awkward corners, there is an electrically-driven grass cutter. This has a high-tensile steel blade, mounted direct on the end of the motor shaft, which revolves at high speed. It is also useful for trimming lawn edges.

#### HEDGE TRIMMERS

An electric hedge trimmer of the reciprocating clipper type is a first-class labour saver. It should be well maintained and used with care; and always powered through a portable transformer so that the operating voltage is reduced to 110.

#### ELECTRIC HOES AND CULTIVATORS

These have much to offer the busy gardener and with a little practice in their use can become very useful tools indeed for hoeing between herbaceous plants, cultivating between soft fruit bushes, and preparing vegetable ground for sowing, even to actually drawing the drills for peas and beans.

#### ELECTRIC PUMPS

For an expenditure of a little over £10, an electric pump will provide the power for a stream in the garden. In large gardens, pumps can also be used for irrigation, spraying fruit trees, for straightforward pumping from wells.

#### ARTIFICIAL LIGHT AND PLANTS

To the keen gardener with an experimental turn of mind, electric light (provided the correct lamps are used) can be a very useful asset indeed.

#### SUPPLEMENTARY LIGHTING

This is used to provide high-intensity lighting to plants, seedlings and cuttings



to supplement natural light during the winter, and produce vigorous, healthy plants during the early part of the year.

Commercial growers use 400-watt mercury vapour lamps for raising tomato and cucumber seedlings during the early months of the year, but the average gardener will find that fluorescent tubes are quite suitable for this purpose. They can be used singly, or in banks of two, three or four. A 5-ft., 80-watt reflectorized tube will effectively illuminate a bench area of 5 by 1½ ft. when mounted 2 ft. above the bench. Under such a lamp all manner of seedlings and plants can be grown, and some plants, such as gloxinias and saint-paulias, are quite content to spend the whole of their lives under artificial light.

The lamps can be controlled by a time-switch and burn throughout the day, or they can be switched on at dusk and left burning to extend the day to 16 hours.

#### REPLACEMENT LIGHTING

With these same lamps it is possible to grow a wide range of plants entirely by artificial light, where a temperature of 60° F. (15° C.) can be maintained. The area the lamp will effectively illuminate and the mounting heights are the same as for supplementary lighting. About 14 to 16 hours would be a suitable period of light each day, but this could be the subject of experimentation.

#### BULB FORCING BY ARTIFICIAL LIGHT

While there may be some doubts as to the desirability of replacement lighting, there is no doubt that bulb forcing by electric light is useful. In a cellar or shed, one or two ordinary 100-watt electric lamps can be used to force bulbs quickly and easily.

Daffodils and tulips are the most suitable. The varieties that are normally forced should be boxed and plunged under peat or ashes in the normal way and brought in for forcing when the shoots are an inch or so high and there is

evidence of vigorous root action. Daffodils and tulips should be given 12 hours light out of each 24, with one 100-watt lamp for every sq. yd. of bulbs mounted about 3 ft. above them. If daffodils and tulips are forced together, maintain a temperature of 60 to 65° F. (15 to 18° C.). Do not over-water the tulips and never spray the buds or foliage from above.

For hyacinths the treatment is a little different as they require, with the exception of a few varieties, 10 days in the forcing shed in complete darkness at 75° F. (24° C.). From then on, 12 hours artificial light can be given each day and the temperature lowered to 70° F. (21° C.)

#### DAY-LENGTH MANIPULATION

The time of flowering of mid-season and late-flowering chrysanthemums can be delayed by maintaining a day length of over 14½ hours from mid-August until early October.

These varieties are known as short-day plants and do not develop their buds until the length of the day drops below 14½ hours—about mid-August.

Quite low intensity light is sufficient for this purpose and is applied by hanging 100-watt tungsten lamps over the plants out on the standing ground. The lamps are mounted at 6-ft. intervals 6 ft. above the rows, each line of lamps being sufficient for a 4-ft. bed.

The best response is obtained by switching the lamps on each night from midnight until two a.m. by a time-switch.

#### MISCELLANEOUS USES

In addition to these various applications there are several other uses of electricity, such as automatic watering and mist propagation, a method by which cuttings are automatically sprayed with a fine mist.

The combination of a number of these applications in a greenhouse or frame can make it completely automatic.





ODONTOGLOSSUM CRISPUM

## Orchids in the Greenhouse

ALL types of orchids can be grown in heated greenhouses, provided their natural living conditions are imitated.

The jungle, with its high temperatures, heavy shading and excessive and continuous humidity, is the home of the "tropical" orchids. In the savannah, at about 2,000 ft. above sea level, where the jungle is not so thick and where the

temperatures are more moderate by night, can be found the "intermediate house" orchids, clinging to the drooping branches of the trees that line the streams and gullies. In the Himalayas and in the Andes, at heights between 5,000 and 10,000 ft., where conditions are cooler and the atmosphere more rarefied, grow the so-called "cool house" orchids.



ODONTOGLOSSUM GRANDE

The latter are the orchids whose conditions of growth can be most easily imitated in the greenhouse, and they and the genus *Cymbidium*—the easiest orchids to grow—are discussed here.

### SELECTION

It is possible to buy seedlings of orchids such as cymbidiums for a few pounds a dozen, although seedlings from first-class parents are more expensive and are sometimes more difficult to grow successfully. It is therefore advisable to buy a number of larger, robust plants which are of flowering size.

Very cheap plants should be avoided, as they are probably rootless or one of the poorest types of orchid. The plants recommended in the list on pages 927 and 928 can be bought for a relatively low price, and are only a few of the many hundreds available in the British Isles from reputable orchid nurserymen.

Cymbidiums come into flower during the winter and will remain in flower for many weeks. The flowers should be cut a few weeks after they open, because they are waxy and heavy, and if the plant is strained, the following year's growth will be delayed.

## COOL HOUSE ORCHIDS

Normal cool house orchids include approximately 100 genera, 4,000 or 5,000 species and many thousands of hybrids. Among these there are even some of the more exotic and magnificent orchids, such as *Vanda coerulea*, the blue Indian orchid; the rosy-white *Cymbidium insigne* (syn. *C. sanderi*) from Cochín-China; the brilliant orange *Dendrobium fimbriatum* from India, and its variety *oculatum* with two rich crimson eyes, also from India.

These orchids need a constantly moist atmosphere, though humidity will reach about 100 per cent in the spring and summer months during the day, and drop to as low as 60 per cent during the winter nights.

In the winter the temperature in the greenhouse can be allowed to drop to as low as 45 to 48° F. (7 to 9° C.) and should rarely be raised artificially above 50 to 55° F. (10 to 13° C.).

Give the orchids a little extra artificial heat during the spring months when it is often cold and dank in the early morning, but avoid high temperatures towards the end of the year when the

bulbs are maturing.

If there is adequate moisture in the atmosphere, sun heat can increase the temperature to as high as 80 to 85° F. (27 to 29° C.) without damaging the plants.

The exception to these orchids which tolerate extremes of temperature are the pseudo-bulbless orchids. These do not have bulbs above ground to contain moisture and nourishment, and so require a constantly even temperature, preferring a range of not more than 20° F. (11° C.), approximately between 48 and 68° F. (9 and 20° C.).

A typical pseudo-bulbless orchid is *Disa grandiflora*, from The Cape, which grows at a high altitude in a cool, moist atmosphere; *Cypripedium insigne* is another popular species.

*Odontoglossum crispum*, from Colombia, which grows on trees clinging to the almost vertical sides of north-south valleys and gorges, through which run fast-moving, moisture-giving streams, is representative of another cool house group now widely grown.



## SHADING

The shading of orchids is essential, but should be carried out judiciously as it cuts out the sun's heat as well as the sun's light. Few plants suffer from too much sunlight, whereas many suffer from too much shade, and it is far easier to over-water a plant in a heavily shaded greenhouse than in a house that receives a lot of light.

From November to February the greenhouse can be left fully exposed to direct light. In March and April such exposure would be dangerous, because the plants are often rather soft after the winter, and at midday the greenhouse should be shaded on the side exposed to the sun. An easy method is to stipple about 50 per cent of each pane of glass, usually the central part, with whitewash. During March, April, September and October the blinds should be in position ready to be let down in case there are some exceptionally sunny days, and in the four summer months, from about mid-April to mid-August, full use should be made of the blinds.

## WATERING

The heating of the greenhouse and the shading of the glass have a direct bearing on the amount of water needed to keep the plants in perfect condition.

Do not water the plants very often until new growth appears after the turn of the year. The majority will start to grow as late as February or March, or even April, but some tend to grow rather quickly after their short winter rest. They should be examined at least once a week in the first months of the year, and twice a week by the middle of March, when the days are lengthening.

Never water a wet plant, but never allow a plant to dry out to such an extent that it is "paper" dry. The leaves and the surface of the compost will indicate if the plant is too dry, and if it is, dip the pot

into a bucket of rain-water to expel all the air, before watering again with a watering-can.

During the winter months orchids with pseudo-bulbs (the moisture containing, bulbous parts of the plants) require relatively little water. If they are watered excessively at this time the plants will tend to grow again too quickly and will fail to produce their flower spikes.

## VENTILATION

Fresh air is almost as essential to orchids as a moist atmosphere. It is difficult to use the roof ventilators freely in the winter, and often also in the spring and autumn when the wind frequently veers to the east; therefore it would be wise to introduce an electric ventilator into the gable end of the greenhouse with a corresponding small vent in the entrance door.

But an electric fan will not be necessary if the ventilators on the leeward side are used judiciously—an opening of even  $\frac{1}{4}$  in. is often enough to change the air in a short time.

The amount of fresh air introduced into the house should be related to the prevailing atmospheric moisture content and temperature. A large proportion of the air in a small greenhouse of 10 by 12 ft. is changed by merely entering the house twice a day.

## REPOTTING

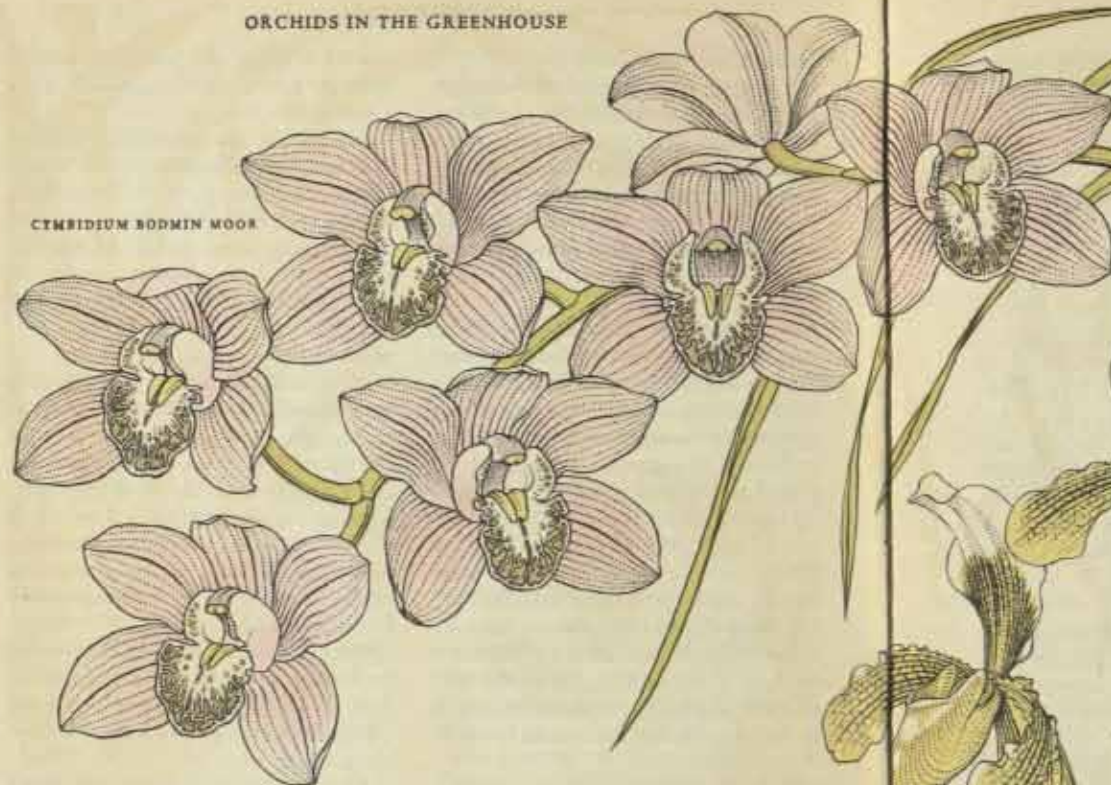
The correct time to repot orchid plants—they are bought from the nurseryman in pots—is when the new growth starts, that is when the base of the bulb swells and new roots appear.

Never use dirty materials in the culture of orchids. Wash the pots and tureens carefully before use. The pots should be porous, and filled with crocks to a quarter of their depth.

Cover the crocks with a handful of compost. Trim the roots and spread



CYMBIDIUM BODMIN MOOR



CYMBIDIUM INSIGNE  
SANDERAE



them over the compost and pack them in with pinches of more compost, which should be worked in with a pointed piece of hardwood (a wooden label is suitable) and with a downward and inward motion. Each plant should be positioned so that the base of the leading growth is level with the pot rim and 1 to 2 in. away from it. Continue to pack in the compost and surface it evenly by trimming it to within a  $\frac{1}{4}$  in. of the top of the pot.

The compost should be made up of three parts *Osmunda* fibre (*Osmunda regalis*) to one part sphagnum moss, half a part crushed crocks and charcoal

and a handful or two of crushed bone—one part beech or oak leaves, well and evenly chopped, may also be added as desired.

### CYMBIDIUMS

Cymbidiums are terrestrial plants whose pseudo-bulbs are sheathed and surmounted by long leaves. The large flower spikes bear two to 25 flowers; there are no hard and fast rules as to their culture. If the greenhouse is kept at a temperature and atmosphere that the gardener himself finds comfortable, the plants will thrive.



DENDROBIUM PIERARDII

EPIDENDRUM RADICANS



Water them fairly frequently, except during cold, damp weather and ventilate the greenhouse whenever possible. Even night air can be admitted when the outside temperature is unusually high in summer, but never expose cymbidiums to draughts.

## HEATING

Keep the temperature between 45 and 80° F. (7 and 27° C.), and use artificial heating as little as possible. In winter never attempt to force the temperature much above 50° F. (10° C.); on many days it will naturally and beneficially rise higher, and at night the temperature will drop to 45° F. (7° C.).

If there is a heavy frost or a breakdown in heating, and the temperature drops below 45° F., keep the plants dry, place them on the ground, and cover them with layers of paper. They will then survive many degrees of frost for a short time, and will flower well, although later in the season—in May.

Shading is necessary in early spring and summer, and should be in place by the end of February or early March.

Give less shade in autumn in order to harden the plants for the winter and to ensure flowering.

Winter is the flowering season for cymbidiums in the British Isles, the early-flowering kinds starting as early as November. All continue flowering until May.

Cut the flowers when the top bloom has been open a full week and they will last several more weeks in water.

## REPOTTING

Repot the plants after flowering when the new growths are 3 to 6 in. high. Cut away all dead roots and, if there are too many healthy roots, shorten them to 4 in. Do not be afraid of cutting them, because the thick, heavy pseudo-bulbs will keep the plants going for some time. Repot into reasonably large pots in the manner explained on page 924, but add one part fibrous loam to the compost.

After repotting do not water the compost for seven to ten days, but if possible keep the foliage syringed and the tops of the pots slightly dampened to encourage new root action.

Further details about the culture of orchids can be obtained from articles that appear in gardening periodicals. The prospective orchid grower is also advised to visit a reputable orchid nursery before making a choice of plants.

## SUGGESTED PLANTS

*For a greenhouse capable of maintaining 45° F. (9° C.) in winter.*

The following selection will give variety not only in flower colour, but also in the shape and habit of the plant and flowers.

*Cochlidia noezliana*, scarlet flowers, 1 to 1½ in. across, on slender curving stems 6 to 8 in. long, in April to May. Very floriferous.

*C. rosea*, 10 to 15 rose-coloured flowers, less than 1 in. across, on pendant stems in winter and spring.

*Cymbidium giganteum*, 8 to 20 fragrant, reddish-green flowers, 4 in. across, on spikes 16 to 24 in. long, in December.

*C. tracyanum*, 15 to 20 fragrant golden-brown flowers, 4 to 5 in. across, on spikes 2 to 3 ft. long, in late autumn.

The six following cymbidiums are hybrids that flower from January to April, and the blooms measure about 3 to 4 in. across:

*C. Bodmin Moor*, 14 to 16 flowers in various shades of yellow, of good form and texture.

*C. Cérés*, up to 24 bronze-red flowers. Easy to grow.

*C. Erica Sander* and its hybrids, 14 to 16



clear green flowers in arching sprays, a little shy in flowering.

*C. Louis Sander*, 12 to 16 large, well-formed, cream and pink flowers of good texture.

*C. Pauwelsii*, up to 30 golden-bronze flowers with a rich red lip. An old hybrid with an outstanding habit.

*C. Pearl*, numerous, large, cream to buff-pink flowers.

*Cypripedium insigne*, solitary green and brown flowers, often 3 in. across, from November to January.

*C. insigne sanderæ*, a beautiful yellow and white form.

*Dendrobium densiflorum*, a spray of white and gold flowers, 8 to 10 in. long, from April to May. Each pseudo-bulb can produce two to three inflorescences.

*D. nobile*, amethyst-pink and white flowers, 2 to 3 in. across, from February to March.

*D. ochreatum*, orange-yellow flowers, about 2 in. across, in spring.

*D. pierardii*, yellow and pale mauve flowers, 2 in. across, borne in clusters of twos and threes from nodes from March to April.

*Epidendrum O'brienianum*, orange-scarlet flowers, 1½ to 2 in. across, from May to July.

*E. radicans*, bright orange-red, long-lasting flowers, 1 to 1½ in. across, from March to June.

*E. vitellinum*, 10 to 12 orange flowers, 2 in. across, in autumn.

*Laelia anceps*, inflorescence 20 to 24 in., with three to five mauve and pink flowers, 3 to 4 in. across, in December and January.

*L. gouldiana*, three to eight amethyst-pink flowers, over 4 in. across, in winter.

*Maxillaria picta*, fragrant reddish-brown flowers, ½ to ¾ in. across, in winter.

*Odontoglossum grande*, four to nine golden, chestnut-blotched, long-lasting flowers, up to 6 in. across, borne on stiff spikes from November to February.

*O. jamesianum*, very large white flowers from apex of bulb, from March to May.

*O. pulchellum*, ten or more fragrant white flowers, 1 in. across, on spikes 1 ft. high, in March and April.

*O. schlieperianum*, golden, chestnut-blotched flowers, which are similar to *O. grande* but smaller and more numerous, in September.

*Oncidium crispum*, 10 to 20 golden-brown flowers on a branched spike in spring.

*O. forbesii*, 10 to 15 rich golden-brown flowers, 2 in. across, from October to November. Branched inflorescence 2½ ft. long.

*O. sphacelatum*, numerous, golden-yellow flowers, over 1 in. across, in spring.

*O. tigrinum*, red and yellow flowers, 3 in. across, on 3 ft. long panicles in winter.

*O. varicosum*, numerous medium-sized, golden-yellow flowers from September to October on a spike 4 to 5 ft. long.

Any of the cool-growing hybrids of these species are also suitable.

# Carnations

IT is impossible to say when the culture of carnations began. They have been esteemed and cultivated in Europe for many centuries, but there is no record of their introduction to Great Britain. The story that they came over with William the Conqueror lacks evidence, but could be true. Judging from old paintings, it seems that for many centuries they differed little from their wild ancestor, *Dianthus caryophyllus*, a native of south and west France. When they began to vary from the wild type is not known, but it is certain that the flowers had reached a high degree of perfection early in the 19th century.

Three principal types of carnation are now grown: the border and the perpetual-flowering carnation, both of which are described in detail below, and the marguerite or Chabaud carnation, which is grown from seed. Marguerite carnations make splendid bedding plants, but their blooms are much inferior to those of the other two kinds. Their culture is the same as that of half-hardy annuals, and they are therefore not further described here.

Unfortunately, inferior plants of all types of carnation are frequently sold, and sometimes it even happens that plants sold as border or perpetual-flowering carnations turn out to be marguerite carnations. There are, however, a number of absolutely reliable specialist firms, and it is best to buy from them.



BORDER CARNATION—LAVENDER CLOVE

## BORDER CARNATIONS

Carnations of more or less pure descent from the wild species are known as border carnations, and good specimens have a perfection of form and colouring found in few other plants.

The flower is of symmetrical shape, with broad, smooth-edged petals, and there are certain technical terms used to describe the types of colour marking.

Flowers of a single, even colour are called selfs.

In other cases, the basic colour is called the ground, and this may be marked in various ways. Where the markings are irregular or the colours blend, the flowers are called fancies. Picotees have a

ground colour of white, yellow or buff, and the marking is confined to a band, which may be broad or narrow, round the edge of the petal. Those that have radial stripes or wedge-shaped marks are called flakes if the marks are of one colour only, and bizzarres if the marks are of more than one colour.

The border carnation is a hardy perennial, producing in its first year a single flowering stem, which bears several flowers about July. Two-year-old plants will have a mass of bloom on several stems. Although some people keep plants for a third or fourth year, it is better to replant after two years.

## HABITS OF GROWTH



The border carnation is bushy in habit. In its first year a single stem bears several flowers about July; in the second year the plant has a mass of flowers



The perpetual-flowering carnation produces longer and more branching stems. It is grown under glass to produce flowers throughout the year



## SITE AND ASPECT

It is essential that the border carnation has a winter rest, and therefore it does not grow properly in countries where the winter is too mild.

Exhibitors often grow border carnations under glass, and indeed some varieties are suitable only for this purpose, but this is done merely to control watering and to protect the blooms. The plants are completely hardy and the greenhouse does not require heating.

Border carnations need a sunny position in an open place where the air can circulate freely; they should not be sheltered by other plants. They are highly resistant to many chemicals and grow particularly well in the smoky atmosphere of industrial areas. They also resist salt spray better than most plants, so they do well near the sea, and they thrive in chalk soils.

They are intolerant of stagnant moisture, and need good drainage. Where there is any doubt about drainage it is advisable to raise the bed 6 in. or so to ensure success, because the plants are surface-rooting.

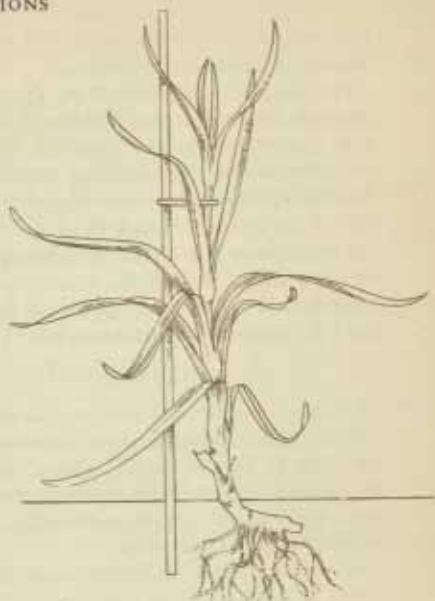
## PREPARING THE SOIL

Border carnations will grow in most soils, provided they are not acid. If a simple soil test shows that the soil is acid, add carbonate of lime at 8 oz. to the sq. yd. after digging.

Periodic checks should be made, particularly in industrial areas, for there the rain is usually acid and leaches out the lime remarkably quickly. If necessary, carbonate of lime at 2 oz. to the sq. yd. can be applied to the soil while the plants are growing.

Provided the sub-soil is porous, deep digging is not needed, turning to a depth of 9 in. being sufficient.

Well-rotted stable manure or compost is beneficial if buried below the top



**PLANTING A ROOTED LAYER**  
Border carnations should be planted firmly but not deeply. The root ball and soil round the plants should be moist before planting. Support if necessary with a short stick and a ring tie

spit. Peat and leaf mould should be avoided except by experts, for after a time they tend to make the soil acid.

Wood or bonfire ash, at up to 8 oz. to the sq. yd., and soot that has been stored for at least three months, at up to 4 oz. to the sq. yd., are particularly beneficial if hoed into the top 4 to 6 in. of soil after digging. Bone meal should also be used, at 4 oz. to the sq. yd.

## PLANTING

After preparing the bed, allow it to settle for a month or so and water it well unless there is plenty of rain. Autumn is the best time for planting, but spring is almost as good. Young plants that have been grown in  $\frac{3}{4}$ -in. pots are usually sent out by nurserymen. The root ball and

the soil round the plants should be thoroughly moist before planting.

Put the plants in about 15 in. apart, planting firmly but not deeply. It is very important that no more of the stem than is absolutely necessary should be below soil level; in no case should the base of any leaves be buried. Deep planting invites stem rot, and the temptation to plant deeply to keep the plants upright should be resisted. Support can be given by a short stick and a ring tie.

### CULTIVATION

In winter it is only necessary to firm in young plants if they become loosened by frost; to ensure that all plants are secure enough not to be broken by strong gales, and that no leaves or other rubbish collect round the main stems.

As the soil dries in spring, remove weeds by shallow hoeing, not more than  $\frac{1}{2}$  in. deep. Larger weeds should be removed by hand, for border carnations have shallow roots, and can be ruined by deep, vigorous hoeing.

If the soil has been properly prepared, young plants will not need spring feeding, but if it has not, and as a treatment for older plants in any case, apply special carnation fertilizer carefully following the manufacturer's instructions. Ordinary garden fertilizers usually have too high a proportion of nitrogen for carnations; this leads to large, sappy growth, which will make the plants prone to disease, and it may also cause the calyces of the blooms to split. Never use organic mulches, for they rot the stem.

Border carnations are fairly resistant to drought, but if there is a long dry spell, give them a good soaking of water at the rate of at least 5 gal. to the sq. yd.

### STAKING AND DISBUDDING

As soon as the flower stems begin to grow, insert a thin 3-ft. bamboo cane

close to each stem, and secure the young shoot to it with a ring tie, which can be moved upward as the stem grows.

It is most important that the growing tip should not be broken, and border carnations should therefore never be stopped.

The main stem usually carries numerous side stems, and the plant should be disbudded until one bud is left at the top of the main stem and one at the end of each side stem. Disbudding should not be too early or too vigorous; the buds should be removed when about the size of a pea. The top or crown bud opens first, sometime in July, and the side buds follow in succession.

### PROPAGATION

#### LAYERING

Cuttings of border carnations are difficult to root except in a mist propagator; the usual method of increase is by layering.

Do not layer more shoots than are required, because each layer robs the parent plant of a flower stem the next year. One-year-old plants provide the best layers.

To form a rooting medium, stir into the soil round the plant a mixture of two parts by bulk of peat, one part sharp sand and preferably half a part of vermiculite. The mixture should be moist. (Peat can safely be used here, because it does not remain long enough to acidify the soil.) When flowering is over, layer the carnations in accordance with the instructions given in *Propagation*.

#### GROWING FROM SEED

Border carnations do not come true from seed, and there is great variation in the flowers of seedlings, most of them being inferior to named varieties. Very good blooms can, however, be obtained from good seed sold by specialist nurserymen, and there is always a remote chance of producing an outstanding seedling that

## CARNATIONS

### LAYERING



Select the shoot to be layered and remove the leaves from the lower part. Cut cleanly into the stem to about half its thickness, just below a joint. Extend the cut to just below the joint above to form a tongue. Cut off the end of the tongue.

Cut off the end of the tongue



A layer beginning to root from the tongue

Keep the cut open and press the tongue into the soil. Peg down with a layering pin and cover with soil



CARNATIONS



PERPETUAL-FLOWERING CARNATIONS.

can later be propagated by layers to form a new variety. Seedlings are often very vigorous, and make a splendid show in their second year.

Seeds are best sown in boxes in April or May, using the John Innes seed compost. Cover the seeds with not more than  $\frac{1}{2}$  in. of soil; at a temperature of 55 to 70° F. (13 to 21° C.), germination will take place in seven to ten days. Pricking and planting out are the same as for any hardy perennial.

### PESTS AND DISEASES

Carnations are seldom attacked by pests, and such common ones as greenfly and caterpillar can be curbed if the usual insecticides are applied.

Cuckoo spit or soapy blight is serious on carnations, and can be cured by using any usual insecticide in sufficient quantity to wash off the froth. Maggots sometimes bore into the stems in winter, but this can be forestalled by spraying the plants every ten days or so during the autumn with a repellent insecticide such as B.H.C. White spots on the blooms of dark varieties, caused by thrips, can be prevented by applying D.D.T. or B.H.C. to the buds.

Stem rot, due to bad drainage or over-deep planting, is serious. The plants should be destroyed, the drainage of the bed improved and new plants put in at the proper depth. Rust, appearing as pustules of brown powder on the leaves in autumn, is a nuisance but not fatal. As soon as the disease appears, use a sulphur spray, according to the maker's instructions, on all plants, whether they are affected or not.

### RECOMMENDED VARIETIES

The number of outdoor varieties of border carnation is very large, and a short list therefore depends to a great extent upon personal preference.



BORDER CARNATION  
FRANCES SELLARS



BORDER CARNATION  
CHERRY FLAME



PERPETUAL-FLOWERING CARNATION  
GOLDEN RAIN

## CARNATIONS

When making a choice from specialist catalogues, remember that:

1. Some varieties do well only if they are grown under glass, and if outdoor varieties are required, this should be specified;
2. Blooms of scented varieties are usually of less perfect form than unscented varieties;
3. Yellow or apricot varieties are never scented;
4. The relative merit of varieties differs from district to district.

The following is a good general selection, all between 2 and 3 ft. tall:

### WHITE AND WHITE GROUND

Madonna, white.

Snow Clove, white, scented.

Alice Forbes Improved, white heavily marked with rose.

Merlin Clove, white edged and marked with purple, scented.

Robin Thain, white, edged and marked with rosy-red, scented.

Picotee Fascination, ivory-white, thin purple edge.

### YELLOW, YELLOW GROUND AND APRICOT

King Cup, sulphur-yellow.

Sunstar, yellow marked with bright scarlet.

Catherine Glover, yellow marked with scarlet.

Santa Claus, yellow picotee, purple edge.

Consul, flame-apricot.

### CRIMSON

Crimson Model.

Oakfield Clove, dark, scented.

Perfect Clove, glowing, scented.

### SCARLET

Royal Mail.

Fiery Cross.

Scarlet Fragrance, scented.

### PINK

Pink Model, salmon-pink.

Frances Sellars, rose-rink.

Pink Pearl, pink with apricot tone.

Salmon Clove, salmon-pink, scented.

### PURPLE AND LAVENDER

Leslie Rennison, pale purple overlaid with rose, scented.

Lavender Clove, full-centred, lavender-grey, scented.

### BIZARRES AND FLAKES

Apricot Bizarre, apricot marked with carmine and rose.

Cherry Flake, cerise marked with maroon.

Scarlet Flake, orange-scarlet marked with chestnut.

## PERPETUAL-FLOWERING CARNATIONS

The familiar carnation of the flower shops, the perpetual-flowering carnation, is so different from the border carnation that many nurseries specialize in either one or the other.

The perpetual-flowering carnation began to be developed about the beginning of this century, and it is now the most widely grown. Although the border carnation features in its ancestry, it is a hybrid involving several *Dianthus* species. It has a branching habit and produces a flower at the end of each

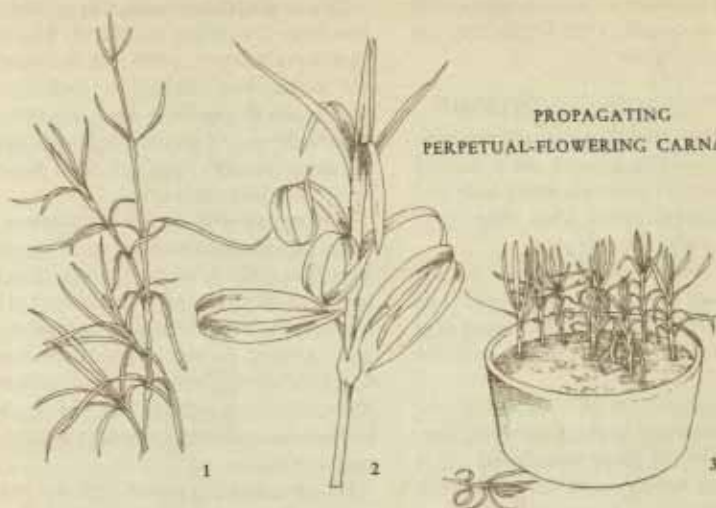
branch. The flowers usually have petals with fringed edges, although varieties with nearly smooth edges are often grown. Fringed-edged carnations are preferred commercially as they travel better. Commercially, too, self-coloured flowers are preferred, but there are also varieties with markings similar to border carnations.

As its name implies, the perpetual-flowering carnation blooms throughout the year, and its ability to flower in the winter is one of its chief assets. It does

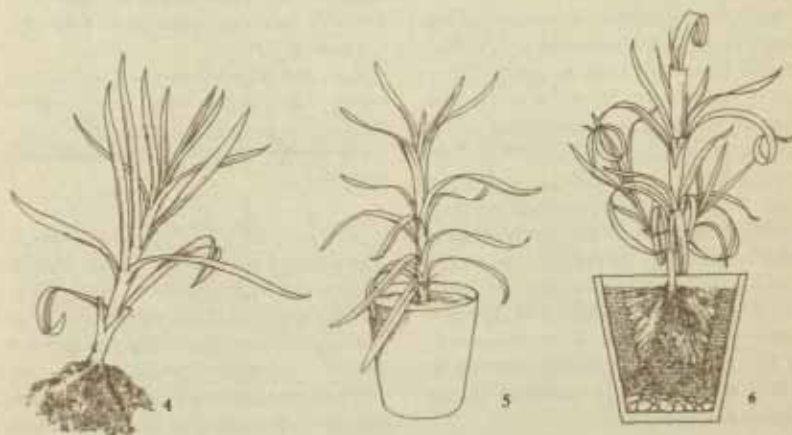


## CARNATIONS

### PROPAGATING PERPETUAL-FLOWERING CARNATIONS



1. Take a cutting, just below a joint, from a sturdy, healthy plant that has several side shoots on each main stem
2. The cutting should be 4 in. long and have four fully-developed leaves. Trim off the short curly leaves at the base
3. Insert the cutting into a pan of sand, making sure no leaves touch the surface



4. The cutting should have made sufficient roots within 21 days
5. When it is rooted, pot up immediately in a 3-in. pot of John Innes potting compost No. 1
6. When the plant has filled the pot with roots, repot into a 6-in. pot of John Innes potting compost No. 1

well out-of-doors only in countries with mild winters, and in the British Isles it is grown under glass.

### GREENHOUSE CONDITIONS

If perpetual-flowering carnations are to be grown on a large scale, the plants are best grown in concrete-lined beds and carefully prepared soil. More often, however, they are grown in pots.

These carnations will grow in any greenhouse that is large and airy and safe from frost. There should be a space of at least 2½ ft. between the staging and the sloping glass.

Although they need considerable care in cultivation, perpetual-flowering carnations should never be coddled. Once the plants have rooted, the night temperature can be as low as 45° F. (7° C.), or somewhat higher if full winter blooming is required. Although this will tend to rise considerably during the daytime, avoid high temperatures, which will cause soft growth and make the plants liable to disease.

A buoyant atmosphere is essential for these plants, and while some heat will be needed from September to April, it may also be necessary to leave the ventilators open all the year round. Only in really cold winter weather is it advisable to close ventilators in the afternoon, and leave them shut until the following morning.

Some shading will be needed if perpetual-flowering carnations are kept under glass during the summer months, and the greenhouse should be damped down regularly. Shading can be discarded in October, even if the weather is sunny, but be sure to continue giving plenty of ventilation.

### PROPAGATION

The perpetual-flowering carnation is propagated by cuttings taken from a healthy, sturdy plant.

The propagating season can be said to last from November till March, but the ideal time to root cuttings is in December, so that they will be ready for potting up during the early spring, and can, if desired, be placed outside in frames during the summer. They will then flower during the following winter.

Cuttings should be taken just below a joint; they should be about 4 in. long and have four fully developed leaves. With a sharp knife, trim off the short curly leaves at the base of the cutting for about ½ in., so that no leaves touch the sand when the cutting is planted. Do not allow the cuttings to remain exposed to the air, but insert them immediately in the propagating sand.

Fill a propagating pan or 4-in. pot with a layer of broken crocks, covered by about 2 in. of pure silver sand, or washed and crushed river sand. Insert the cuttings into the sand ½ in. deep, so that they stand upright and 2 in. apart. Take care not to bury the base of any leaves. If using the same pot again and again, use fresh sand for each batch of cuttings, or they may fail to root.

Place the pots where they will receive rising heat; at this stage the temperature of the greenhouse should be somewhat higher than usual—approximately 55° F. (13° C.).

### POTTING

The cuttings should root within 28 days, and should immediately be potted individually into 3-in. pots, using John Innes potting compost No. 1. Do not pot too deeply, and water immediately.

When these pots are filled with roots, pot up each carnation into a 6-in. pot, this time using John Innes potting compost No. 2. First give the pot a good base of broken crocks, and pile the compost over this in a mound; then place the plant's ball of roots on this mound, with

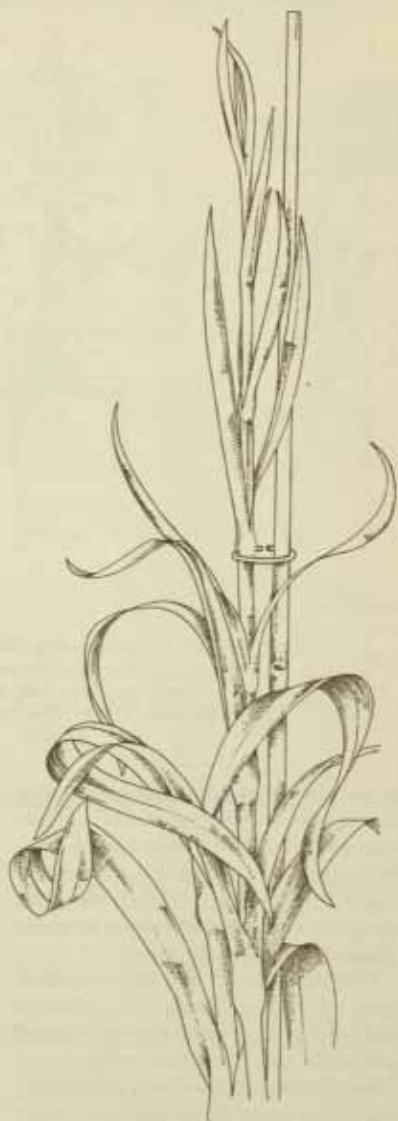
## CARNATIONS

the top of the ball  $\frac{1}{2}$  in. below the top of the pot. Pack more compost round the ball of soil and, most important, press it down firmly. Carnations should be staked at this stage to encourage the stems to grow straight.

Place the pots on a bench covered with ashes, leaving about  $\frac{1}{2}$  in. between each pot. The plants may also, if desired, be stood out-of-doors in a cold frame from May until September in southern districts, or until about mid-August in districts farther north.

### STOPPING AND DISBUDDING

When the carnations are about 10 in. tall, they should be stopped to encourage the growth of flowering shoots near the base.



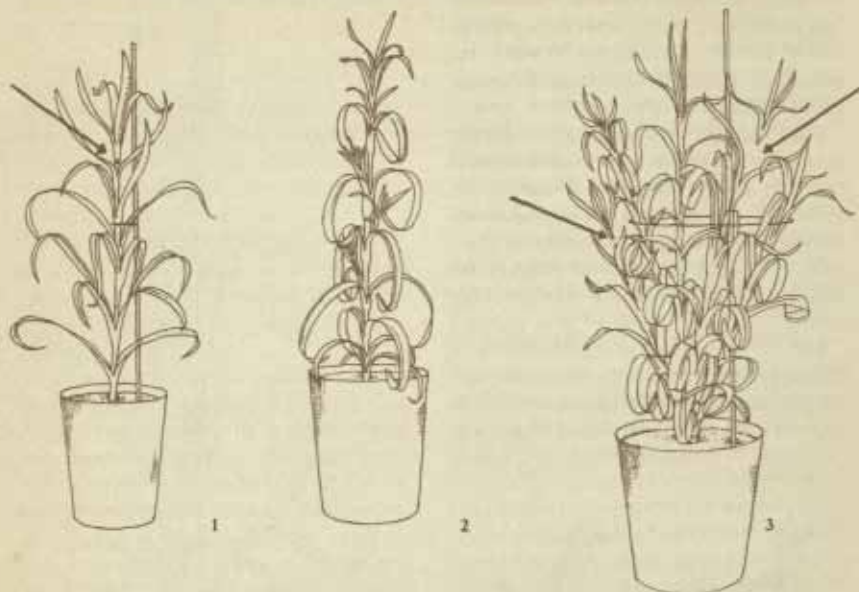
### DISBUDDING PERPETUAL-FLOWERING CARNATIONS

When the buds are about the size of a pea, remove them all except for one at the top of the main stem. *Left:* correct growth stage for disbudding. *Centre:* disbudded growth. *Right:* The flowering stem of a perpetual carnation should be supported. Insert a cane close to each stem and secure with a ring tie. Raise the tie as the shoot grows



## CARNATIONS

### STOPPING PERPETUAL-FLOWERING CARNATIONS



1. A plant ready for first stopping. Snap off about 3 in. of the growing point
2. The same plant showing the side shoots resulting from the first stopping
3. The final stopping should be made when the side shoots are about 7 in. long. Remove the tips of about half of them

of the plant. Snap off about 3 in. of the growing point of the plant. Half the laterals should also be stopped when they reach a length of about 7 in., leaving the others to grow on to flower. Stopping should end by September at the latest for winter-flowering carnations.

The method of stopping described here will vary according to the time of year when the carnations are planted and when they are to be brought into flower. In general, however, a carnation will flower about five or six months after stopping has ended.

Remove all small secondary flower buds to encourage the growth of long stems and larger blooms.

### WATERING AND FEEDING

Water the plants very sparingly in the winter, but give rather more water in the spring. Even in summer, water only when the plants really need it, since over-watering can have fatal results.

Syringe the plants every evening in the summer to prevent attacks by red spider.

Perpetual-flowering carnations need no feeding for the first six months. Thereafter they may be fed with special carnation fertilizer, used in accordance with the manufacturer's directions.

### SECOND AND THIRD YEARS

If the carnations are to be kept for a second year they should be transferred to

A well-grown one-year-old perpetual-flowering carnation, established in a 6-in. pot and supported by a wire ring clipped to a cane



8- or 10-in. pots as early as possible, and no later than about June of the first year. Continue feeding and cultivation as before. By the end of the second season the blooms are usually considerably smaller, and although the plants may be kept for a third year, they should then be discarded.

#### RECOMMENDED VARIETIES

The following varieties of perpetual-flowering carnation are not difficult to grow and give good results in pots:

Allwood's Crimson, large, crimson, heavy cropping.

Ancient Rose, deep rose-pink shading to bronze at the edges.

Canadian Pink, short, rose-pink.

Canadian White, short and stocky, snow-white.

Doris Allwood, salmon-rose, good scent.

Fragrant Ann, pure white, scented.

Golden Rain, clear yellow, free-flowering.

Monty's Pink, pink, scented, disease resistant.

Titian, short, crimson, a good grower.



# Flower Arrangement

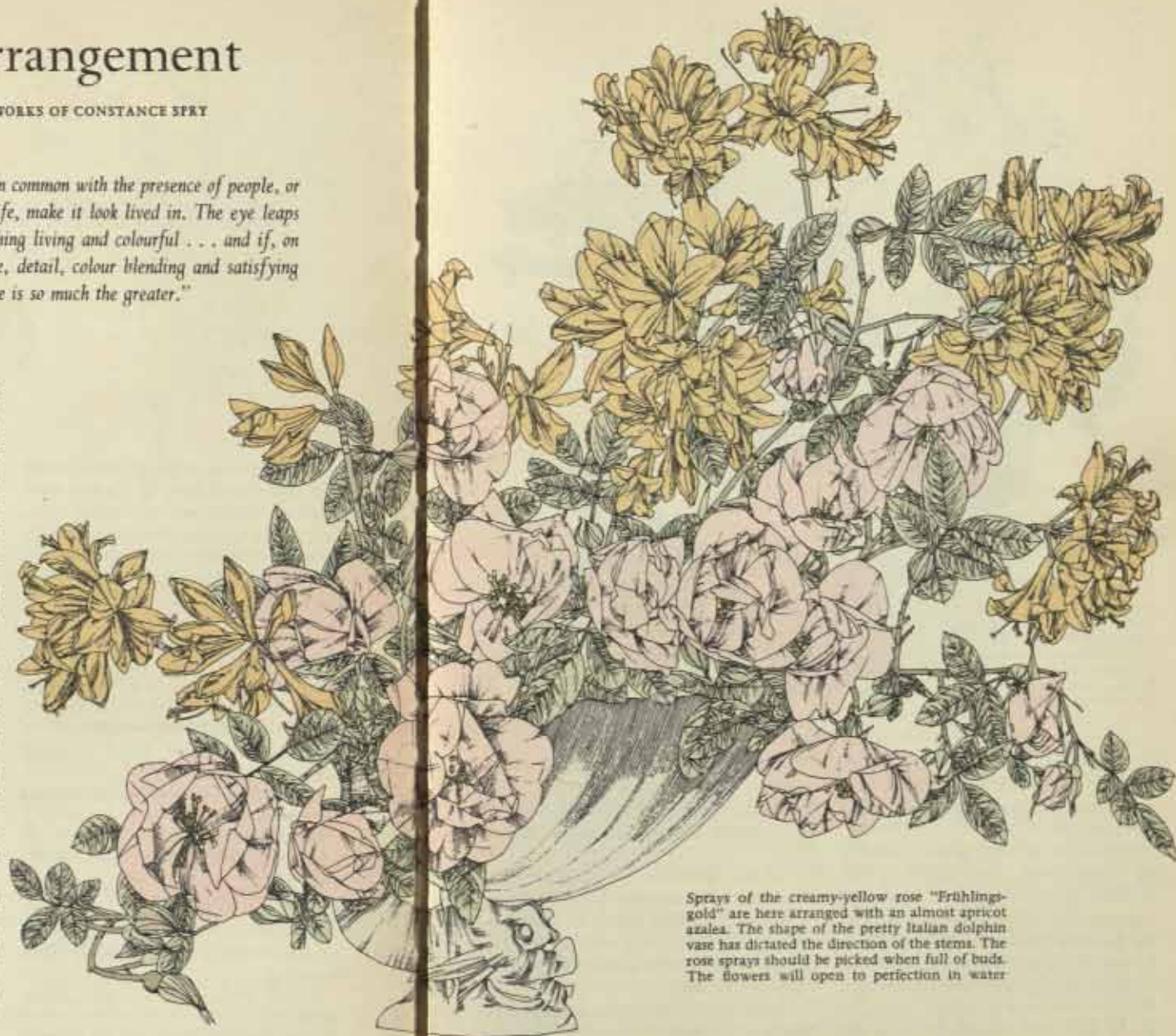
CONDENSED FROM THE WORKS OF CONSTANCE SPRY

*"Flowers in a room have a quality in common with the presence of people, or of a fire. They bring the room to life, make it look lived in. The eye leaps to a vase of flowers, leaps to something living and colourful . . . and if, on nearer view, you find beauty of line, detail, colour blending and satisfying balance, your pleasure is so much the greater."*

THE outline of any flower group is influenced by the shape of the vase. I find the simplest way to get the outline clear is to place in position two or three flowers to indicate the general shape, putting in first the highest central flower and then the two sides; or, for a cornucopia or sauce boat, putting the highest and lowest flowers; or, for a centrepiece on a table, to fix the total length; then, within this framework, to build up the whole.

Proportion is all important. If the flowers are too wide, too low or too high for the vase, the effect will never be good. Generally speaking, choose flowers that are one and a half times the height of your vase. But always be chary of shortening the stems of the flowers. Wherever it is possible to achieve the desired variations in height by pushing the stem farther into the vase, do so rather than chop off a piece.

There are several reasons for this. In the first place the stem seems to take on a more natural, flowing line. Secondly, it is more likely to remain permanently below the water line. And thirdly, you cannot put the stem on again if, by chance, you change your mind.



Sprays of the creamy-yellow rose "Frühlingsgold" are here arranged with an almost apricot azalea. The shape of the pretty Italian dolphin vase has dictated the direction of the stems. The rose sprays should be picked when full of buds. The flowers will open to perfection in water.





This effect can be achieved by using a few carefully chosen branches of lime-green oak flowers. Place these branches in position in a low brass container, then, for contrast, add horse chestnut leaves on one side

Large shells make decorative containers and lend themselves to low and trailing arrangements. Here, nasturtium foliage and blooms give a delicate effect. Pick the flowers when in bud and allow them to open in water



Soft and malleable stems may be induced to take on the required curve by very gentle massage—arum lilies are a case in point.

I feel that in advocating the removal of the leaves from most flowers, I risk criticism. But there is one very good argument for doing it—even apart from the fact that it helps to preserve certain flowers. It is this: one may get a perfect nostalgia during the winter for the sight of a lilac tree, remembering it as a great plume of scented flowers. But when the

time of flowering comes, and you pick a bunch and put it in water just as it comes from the bush, does it not fall short of your winter dream of what lilac should be?

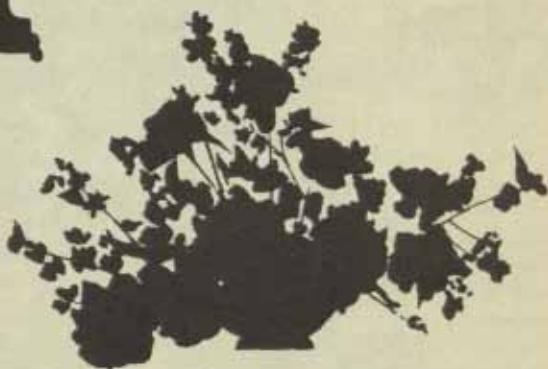
If I am right, then try picking a great deal more lilac and taking off the leaves. Fill your vase very full of its branches, and you will recapture your dream. Try the same experiment with crab-apple and cherry blossom.

But flowers with dramatic whiteness, such as magnolias, camellias, gloxinias



A group of yellow, orange, apricot and pink flowers will look well in a pewter urn. For a rich effect use dark foliage and bold flowers, and add a few ears of green barley

A low open china bowl makes a firm base for a fan-shaped arrangement. The larger flowers are kept low, except for two which provide height and balance. Double paeonies and philadelphus sprays with the heavier leaves removed are ideal



and gardenias, look best with their own leaves.

The most generally useful hint in flower arrangement, I think, is this—try to recapture something of the essential quality of the flower, or of the effect it gives when growing.

For instance, the sweet rocket is a mass of clean white flowers, and its vision in the garden is of massed white. If I pick a dozen or two long stems and put them in a tall vase, I lose something of this effect. So I prefer to cut rather short stems and

crowd them into low containers. In this way I keep that sense of massed whiteness.

#### BACKGROUND

The simpler the background, the more clearly will the character of the arrangement be seen. I like best of all a white-washed wall, against which every quality of colour and line stands out.

Busy, ornamented backgrounds are a handicap. They detract from the effect of the flowers. Where they exist and cannot be altered, you might like to choose a permanent spot in the room for your



Old vases of unusual shape can be used effectively if the arrangement is made in proportion to the container. This small vase holds brownish-purple and greenish-white hellebores banded with golden stamens



flowers and hang a piece of fabric or parchment as a background, or use a mirror.

On the whole, flowers are seen to their best advantage set against an opaque background, with the light shining on them.

A mixed group of flowers when set against light may look confused. However, flowers with particularly translucent petals, such as single Shirley or Iceland poppies, bluebells and willowherb, look charming against the light of a window.

### THE USE OF COLOUR

Try anything once. If you don't, if, for instance, you say: "I don't like red, or yellow, or orange" and leave these colours out of your flower adventures, you are losing something and in the end are so much the poorer.

Remember that if you are trying to achieve a strong note of colour, of red or orange perhaps, the incidence of green will detract from the brilliance of the result. Green, a lovely colour in itself, has the effect of cooling down other colours.

Suppose that in a dull or cold room you choose to make a pool of golden marigolds; you will heighten the brilliance of the effect by the degree to which you dispense with their leaves, though you may strengthen the effect of colour and warmth by the addition of coloured leaves.

#### RED

If you want to achieve a brilliant note of red in a room, perhaps on a cold day, or perhaps to pick up a note of red in a picture, it is possible to get brilliance without harshness by putting together many shades and tones of red, rose, vermillion, crimson, magenta and make a strong, warm effect.

The crashing together of reds may seem frightening at first. But the combination

of, say, azalea flame, the orange of strelicias and red and pink rhododendrons, can produce a glorious torch of colour.

Red flowers look well against walls of pale grey, or egg-shell blue, and, of course, against white. Clear magenta flowers like the wild willowherb are beautiful against pale yellow, so are most mauve, purple and wine-coloured flowers.

#### BLUE

This is not usually a colour that lights up well on its own—it tends to look grey. Blue, mauve and blue-pink or magenta together, however, light up well and, together with purple, look particularly fine in silver or pewter vases.

When these colours occur in flowers like hydrangeas, Michaelmas daisies or petunias, they are helped by reflected light from a polished surface.

#### GREEN

It sometimes comes that, after a feast of colour, one longs for the coolness of green. I confess I turn again and again to all-green groups.

The flowers of the common oak picked before the leaves unfold, and a branch of horse-chestnut—soft lime-green oak flowers, deeper green chestnut leaves and cream chestnut flowers, all in a pale, shining brass bowl—make a quiet-toned picture.

So do the green flowers of spring—lords and ladies, or wild arums, green hellebores and a lovely, grey-green, bell-shaped flower called ornithogalum, Star of Bethlehem, which is as easy to grow as a bluebell.

So often leaves are looked on as material of secondary importance, but they are lovely used by themselves. All through the winter I have vases of ivy in my room—lovely, shining, elegant leaves, unmixed with flowers, delighting the eye. Laurel is another fine evergreen for decoration used by itself, grandly, and

A striking but formal effect for a delicate filigree vase can be obtained by grouping together water lily flowers with their buds and leaves, and surrounding them with flowers, ferns and seed heads. Keep the surround light, so as not to detract from the strength of the water lilies.



not as a sort of stuffing for a few large chrysanthemums.

#### WHITE

Rightly used and placed, white flowers are not cold, they are a high-light—delicately shot through with tinted light and reflecting the colour surrounding them.

If you feel prejudiced against white flowers, I would suggest that before

shutting your mind to their appeal, you might set white tulips or poppies against a delicate wall where strong light falls on them—and look at white flowers with new and considering eyes.

#### MIXED COLOURS

One gets a better and less fussy effect by introducing different colours in broad strokes, rather than in spots. For example, in a bowl of mixed tulips or sweet peas, flowers of one colour, used in proximity, give a cleaner effect than if they are dotted about in ones and twos. And in the case of mixed flowers, two or three flowers of one kind against two or three of another may give a better effect than if they are put in in units.

#### MASS

Contrast of colour is, perhaps, more generally considered than contrast of mass. But on this point there is much to be learned from the still-life masterpieces of the old Dutch and Flemish painters. They grouped together massive fruit and flowers, delicate ears of corn, tendrils of vine, and fine grasses.

We can copy them, putting perhaps a delicate frond of fern against a bold leaf, and so making a contrast of mass and texture. Or we can use fruit, as they so often did, to give weight to the composition. (See illustration on page 962.)

Never be afraid of being laughed at. I was once nearly deterred—by fear of ridicule—from using some particularly beautiful red cabbage leaves with red and grey eucalyptus.

Fortunately, I took courage, and nobody laughed at the result.

#### THE VASE CUPBOARD

The contents of the vase cupboard are of primary importance to anyone interested in flower arrangement. A small range of stereotyped vases is stultifying; what may be a suitable container for the sweet,



morning freshness of a spring bunch, will not necessarily be so for the rich glory of autumn.

As far as the shape of vases is concerned, I prefer an oval vase to a round one—it is easier to arrange well. A boat-shaped vase is good on a chimney piece or a window-sill. A chalice or goblet-shaped container gives scope for a graceful, down-curving line.

A wall vase has much to recommend it. It does not need so many flowers, for one thing, because every stem is silhouetted against the wall and made the most of. Fastened to the wall it will not overturn and can, therefore, carry spreading branches of some weight.

I have seen copper measures cut in two and used this way, and even an old, brass tinder-box filled with honeysuckle—this sort of wall vase is ideal for trailed climbing plants, or sprays of drooping berries.

I have even used a flat-backed bicycle basket on a wall, filled with jam pots of water, and coloured to match the simple flowers I put in it.

Picking the right vase for the right occasion is a question of thought, ingenuity and the seeing eye, rather than expenditure of money. Of course, the possession of one or two beautiful vases is a help, but it is a mistake to work even one's most valued possessions to death.

#### GLASS

Generally speaking, glass vases are best reserved for a few, clean-stemmed flowers such as long-stemmed roses, a branch of magnolia and gardenias. Indeed, in such cases the stems, magnified by the water, may be decorative in themselves.

But glass can be debased by careless use. How often one sees a transparent glass vase showing a confusion of stems in discoloured water, with a still more discoloured sediment at the bottom. Glass

vases should be shining, scrupulously clean. A few drops of ammonia will sometimes remove the stains of old water.

#### CHINA

One of the pleasures of possessing even a small bit of decorative china, such as Dresden or Rockingham, is that, from time to time, one may find exactly the



Stiff and gnarled branches of magnolia rise picturesquely from a marble bowl. The flowers are borne on the leafless branches and, provided they are not bruised or frosted, will last for some time.

right flowers to fill it—the moss rose buds, lily-of-the-valley, miniature pansies, and all the rest of the flowers which inspired the creators of such pieces.

#### EARTHENWARE

Jars, pitchers and honeypots in unglazed earthenware are inexpensive and often of good shape, holding plenty of water.

If their colour is not suitable they may be painted with pale-coloured distempers. Personally, I do not like the effect of shiny oil paints.

#### METAL

Jugs, urns, bowls and preserving pans of good shape in copper, brass, pewter and tin make most satisfactory vases.



Heavy in weight and generally holding plenty of water, they form a secure base for spreading arrangements and larger flowers.

Some flowers, like zinnias, foxgloves and columbines, often look disappointing in a pottery vase, but transfer them to a polished metal container and they come to life.

A vase cupboard may well house a few ordinary kitchen tins—bread, cake and

baking tins, which have probably been many times in a hot oven and taken on a fine surface. These sort of shallow tins are indispensable for long-spreading decorations, such as one might want for a party.

#### WOOD

Wooden vases as such are not very often seen nowadays, although the material is a natural complement to flowers. There are, however, many possible substitutes.

Knife boxes, cheese moulds and milk bowls, all fitted with metal linings, are very useful.

#### FLOWER HOLDERS

I have yet to find anything which answers the purpose of a flower holder better than crumpled-up wire netting.

The tendency of a beginner is to choose a small mesh netting, but when small netting is crumpled up it is difficult, almost impossible, to insert thick stems

without mangling them. A mesh of 14 to 2 in. is best; for this, provided it is of thin quality, will secure a stem at any angle required. For a shallow bowl, it may be necessary to tie the wire in with string, like a parcel. After the flowers are arranged, the string may be cut away. Glass domes, used by themselves, are apt to give the flowers a pins-in-a-pin-cushion effect, but they may well be used with wire netting.

Here two rosettes of grey echeveria have been added to coffee-coloured roses against a background of leaves of smilacina and epimedium that have turned to a soft brown. A direct contrast in colour is provided by sprays of sedum







For table decoration, the long, delicate, curling petals of lily-flowered tulips are valuable. The slender stems of these tulips curve in water, so that the arrangement will be continually changing. Here, yellow tulips are arranged in a brown vase.

## FAVOURITES FOR SPRING

A useful type of holder for small arrangements consists of a heavy, metal base, closely covered with sharp, needle-like spikes which penetrate the base of the stem and hold it firmly in place.

For tiny vases, a frond or two of clean, washed moss is usually sufficient to hold the stems of small flowers in place. But moss used in quantity, like twigs and sand, takes up space and reduces the water capacity of the vase too much.

There is one flower that I think is the very pride of spring—the crown imperial, or *Fritillaria imperialis*. From the moment it first pierces the earth, it is dramatic . . . the drama continues until at last the beautiful and curious bells unfold, and you may see inside the five, clear tear-drops which lie at the base of the petals.

I use the crown imperial in mixed groups as well as alone or with shapely branches. I am sometimes asked if I am deterred from using it by its curious smell. I am not, because I find that when the flowers are placed in water, this is not obtrusive.

Personally, I do not dislike the earthy smell of the crown imperial.

## DAFFODILS

The paler daffodils should not, I feel, be arranged with stronger-coloured kinds. They need to be arranged simply. Cut-glass bowls and the like seem out of keeping. Moss-carpeted baskets, simple dishes and wooden bowls please me better.

One of my favourites is *Narcissus triandrus albus*, the angel's tears daffodil, with its milk-white flowers borne on 4-in. stems. It is surprising how the dignity and grace of so tiny a flower will stand out in quite a large room.

The miniature daffodils are properly regarded as rock plants, but, fortunately, readily adapt themselves to being grown in pots or pans.

## TULIPS

Long-stemmed tulips are magnificent flowers to arrange, but I do not like to see the quality of their line, stem and dignity of form left unconsidered.

For instance, if you take a bunch of tulips and stick them in a trumpet-shaped vase, you have done little to help display their essential qualities. Long ago the people in Holland understood





A charming arrangement for a small marble urn can be made by mixing pale greyish-blue roses, grey echeveria, green cockscomb, tufted grasses, begonia leaves and other flowers. A bunch of contrasting berries on one side gives added interest

this. They had special vases made; sometimes these were tall with holes in the top, and sometimes fan-shaped.

I very often put tulips into large shells or shell-shaped vases, to let the curve of their stems be seen to full advantage.

It is helpful to have some of the very deep-toned tulips for decoration, like *Bacchus* (a dark, plum colour), *Frans Hals* (a deep purple) and *The Bishop* (a fine bluish-purple.)

Such a selection as these, with some soft pinks and such of the stronger reds as your fancy dictates, give you marvelous material for decorations.

#### FAVOURITES FOR SUMMER

Should your mind run, one summer's day, to the richness of purples and lilac, burgundy and amaranth, cramoisy, ruby and garnet, you can—with a basketful of old roses—create such a cascading symphony of colour.

For us, who love and collect them, the term "old roses" means primarily the gallicas, the damasks, the mosses and the albas. They are my precious hobby-horse. I should like to persuade everyone with a garden to grow some of the old-fashioned roses. They have perfection in colour and shape on the one hand, romance and indescribable scent on the other.

These are not the kind of roses that you can arrange in tall vases. You can either cut short stems and mass them in bowls, or you can pick long, heavily-flowered branches.

Old roses are essentially summer flowers, for they have no second annual bloom. Also they have no yellow colouring at all. The comforting thing is that you may cut them at will without doing any harm. Cutting them is, at worst, a slight reduction of the richness; at best, a gentle pruning.

The finest of the damask roses is, to



my mind, Madame Hardy, a large, pure white, fragrant rose showing, when fully open, a pale green eye. Of the French roses, Cardinal de Richelieu has a sombre and exotic richness. Of the moss, Jeanne de Montfort and Nuits de Young are beautiful.

But keep plenty of room in your heart for the common moss rose. This is a poor name for it—for this is the rose that inspired the composers of valentines and the decorators of china long ago. It has slender, beautiful buds which open to the prettiest of pink flowers, and the scent is ravishing.

#### PHILADELPHUS

Summer comes for me, whatever the official date may be, with the first, flower-laden bushes of mock orange. The scent, the grace, the lavishness of this flower tell the glory of summer. It should be arranged in high, wide and glorious profusion.

Almost anyone can grow this shrub. It will grow and flower in a town yard, and you may pick it freely, without fear that you are stealing years of growth. A very fine variety is Virginal, some say one of the finest of the hardy shrubs, bearing quantities of delicately scented, double, white flowers and flowering in late June or early July.

#### FAVOURITES FOR AUTUMN

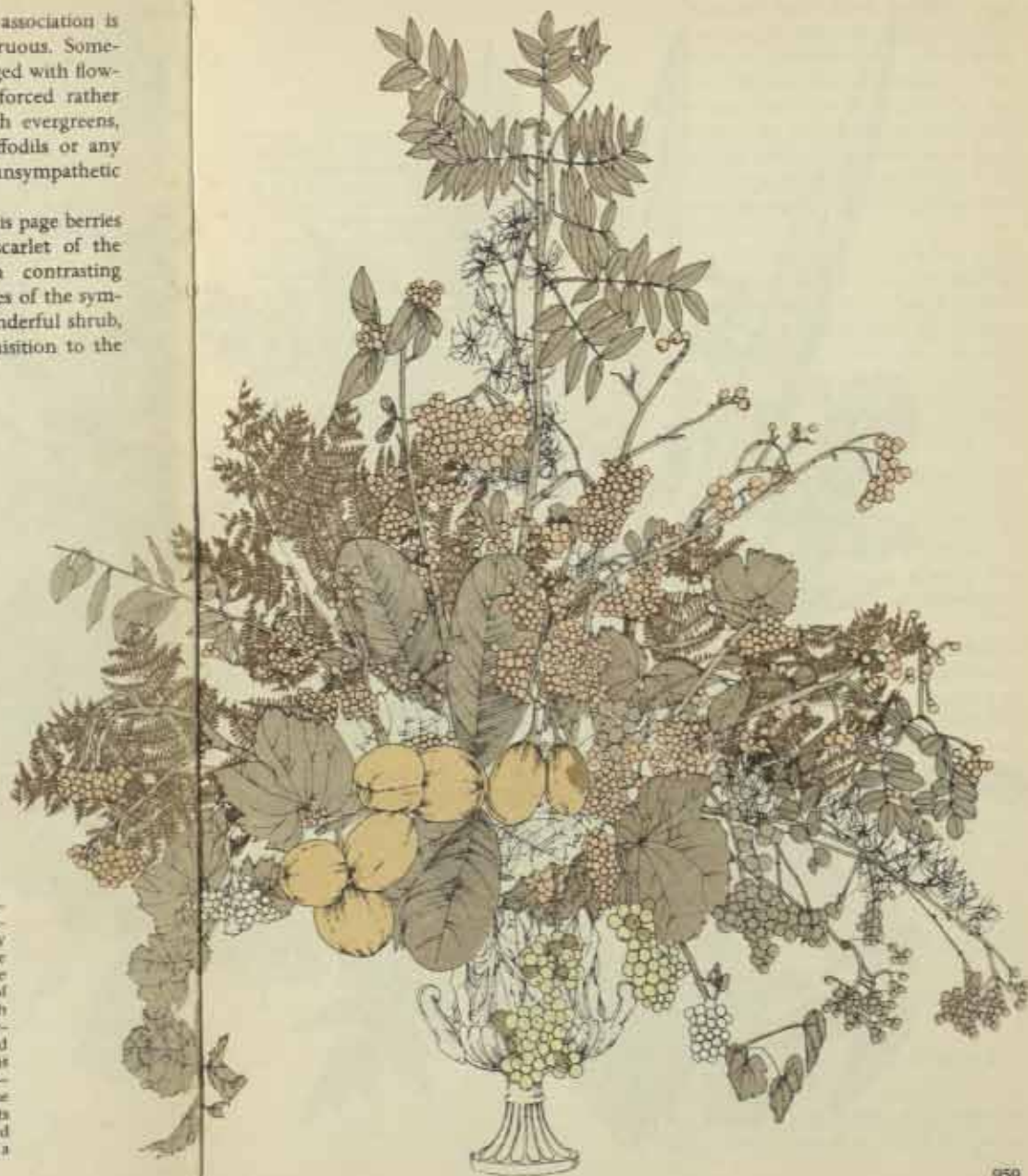
This time of year has its own intrinsic beauties; the magic of a frosty morning, the grandeur of a leafless tree and the smell of wood smoke. The garden, though now beginning to look sleepy, may still be a source of autumn ideas. A few late fruits of crab-apple, seed heads and late flowers may prove an inspiration for a flower and fruit group.

The valuable, and often dramatic, contrasts of form made by the inclusion of berries and fruits in flower arrangements, afford limitless possibilities; provided,

of course, that such an association is pleasant and not incongruous. Sometimes one sees fruit arranged with flowers in a way that seems forced rather than natural. Grapes with evergreens, for example, or with daffodils or any spring flowers can seem unsympathetic and irrelevant.

In the illustration on this page berries predominate—with the scarlet of the common mountain ash contrasting with the white snowberries of the symphoricarpos. This is a wonderful shrub, incidentally, and an acquisition to the flower arranger.

In October and November, overtones of richness in flower arrangement can be caught by combining plants from the hedgerows with some from the garden. In this group, plants of the hedgerow predominate, with scarlet mountain ash, snowberries, dried bracken and wild clematis; but the bold effect is provided by garden plants—white berries of the Chinese rowan, five tawny yellow fruits of japonica, two egg-shaped fruits of the tree tomato and a trail of outdoor vine







During the winter delightful arrangements can be achieved with leaves of contrasting form. The bold swordlike leaves of New Zealand flax (*Phormium tenax*) provide height and are a good foil for the flat sprays of scarlet-tinged *Mahonia japonica* leaves. This colour is strengthened by the grey-blue of *Coprosma arizans glauca* and *Eucalyptus globulus*. The latter is imported from France, and its white buds open into fluffy cream flowers.

Together with dried bracken, vine leaves and the fallen brown leaves of the Himalayan rhododendron, the berries made a pleasant arrangement. But it was not until the fruits were added at the base that the result became satisfying. There are five tawny-yellow fruits from the japonica, two egg-shaped fruits of the tree tomato and a trail of charming outdoor vine.

The japonica fruits came from a plant of *Chaenomeles japonica*. The tree tomato (*Cyphomandra betacea*) is not a garden plant and, although ours stays out all summer in its wooden tub, in winter it is brought into a warm glasshouse. It may be grown from seed in warmth, and flowers in its second year. Our plant grew readily from cuttings.

The vine is *Vitis vinifera purpurea*. Its already wine-red leaves take on, in autumn, even richer tints of purple and the tightly-packed bunches of dark grapes add a wonderful quality to this plant. It is a slow grower, but well worth waiting for.

#### CHRYSANTHEMUMS

I like best to see a limited number of blooms set in a well-considered background of material which emphasizes their beauty. For this purpose there is a whole range of colourings to be derived from plants like eucalyptus, New Zealand flax (*Phormium tenax*), the bare branches of red dogwood, dramatic branches of elm, black-budded grey-stemmed ash and the incense plant (*Humea elegans*).

From these and other subjects it is possible to construct a fine framework for three or five flowers which, given the proper preliminary treatment and continually replenished with water, will last for weeks.

#### FAVOURITES FOR WINTER

I would not miss the country in winter for anything. The shapes of the trees are more lovely now than when they were





A late summer mixture of flowers, fruit and vegetables makes a rich group suitable for a special occasion. Gourds, quinces and pears are placed at the foot of a tall vase, from which trail sprays of wild clematis and *Vitis vinifera purpurea*. In the vase are roses, heads of sweet corn, grasses, grapes and the fruits of the tree tomato

hidden by foliage. The cold, sharp air is exhilarating... and there is quite enough of leaf and flower to keep fresh the vision of spring.

Indoors, in the summer, the group of evergreens shown on the previous page would be too heavy. But during the lean days of flowers, I find that if I can have a good-sized vase filled with green things to give a sense of aliveness to the room, I am satisfied.

In this arrangement are to be found *Mahonia japonica*, New Zealand flax or *Phormium tenax*, and sprays of a charming cypress, *Cupressus arizonica glauca*. The grey of the latter is caught up again in the whitish buds of *Eucalyptus globulus*.

The phormiums are wonderful, strong swords of growth, grey-green and purplish in colour. They last for weeks in water. They are not really rapid growers, though in warm and sheltered gardens they may develop more freely.

#### HELLEBORES

All the hellebores have a name for being indifferent lasters when cut. But in this I think they are maligned; they will last well—as much as two weeks sometimes—if they are watched and cared for.

Picked from the garden or bought from the shop, split the tips of the stems and put the flowers straight into deep, warm water in a cool place, for all of twelve hours. Keep a watchful eye on them after that, and if any flower shows sign of flagging, remove it, resplit the stem and put it back into deep water in a cool place until it recovers. Their beauty is well worth the trouble.

To grow, hellebores are on the whole accommodating plants. They appreciate a well-drained, well-enriched soil, and an annual mulch of rotted manure or leaf soil and protection from fierce sun and strong wind. But with me, they grow in a not very well-drained clay—and the clumps have increased to a large size.

#### SNOWDROPS

Clumps of the loved *Galanthus nivalis*, which the unbotanical among us call the "ordinary" snowdrop, are a delight when seen in a vast carpeting under the bare winter branches of the woodland. But don't let this vision blind you, as it did me for too long, to the possibilities of snowdrops for arrangements.

Take, for instance, four or five flowers of the slender-stemmed *G. elwesii*, with one or two of its broad, grey leaves, and pose them in a small, shallow, saucer-shaped container. Put each flower apart, so their entire form may be seen. Then



you may have—in miniature—all the elegance of a lily and the swinging grace of a fritillary.

The bulbs of this flower are not inexpensive. But when grown properly, they increase and multiply well.

### PARTY FLOWERS

Whether a party be for two or two hundred . . . flowers heighten the note of gaiety, provide a thrill for the senses, give an added touch of excitement, so that the occasion may be a notable memory.

Clearly, for a party you want flowers to be seen to advantage, but not in danger of being crushed.

In a drawing-room the obvious position of advantage is the chimney-piece. The whole shelf should be cleared and a really effective flower arrangement put there. If it is well done, you may find that nothing more is needed in the room.

In a small room, the value of wall vases comes in. I sometimes hang these so that the vase is in the centre of a very large mirror. In this way, one gets good reflections which add to the effect.

One of the prettiest out-of-the-way decorations can be made by using wide sun-hats suspended on ribbons. The hat must be firmly secured, otherwise the water, which is contained in a tin in the crown of the hat, would spill. The flowers are arranged so as to flow out from the sides of the hat. Well carried out, the whole effect is light and gay; it is economical too.

Simple and effective, too, are hanging baskets of cow parsley. For this, fit a basket with cake-tins of water, as this wild flower is a thirsty subject. Pick it two days before the party, put it straight into deep warm water and then, stem by stem, remove almost all the leaves.

### FOR DINNER PARTIES

It is best to have low arrangements of flowers on the table. One of my

favourites is an oval garland of old roses laid round the centre of the table. The roses are picked on short stems early in the day and put in bowls of water in a cool place. Shortly before dinner they are taken out, dried, and laid on a thick oval garland on the cloth. You may protect the cloth with strips of wax paper, if you wish.

### FOR CHRISTMAS

You might like to try a table arrangement that, once made, can be put by and used from year to year.

A piece of tarlatan or organdie covers the centre of the table. In the middle are two big posies of holly and mistletoe, which are surrounded first with circles of stiff muslin, and then with a paper posy frill. This frill can easily be contrived with silver doilies. The candles are fixed in little patty-pans with cement and obscured by leaves and berries.

The oval garland is of holly leaves, cut out of ribbon which is stiffened by being brushed over at the back with a thin solution of gum arabic. The leaves are cut in two pieces. By fixing the halves slightly apart, they appear to have a central vein, which is, of course, the white tarlatan appearing through the gap. The berries, made out of stiffened red satin ribbon, are punched out with a leather punch.

### POT PLANTS

Perhaps it is the fault of the Victorians that we in England make so little use of the graceful, beautiful ivy. They trailed it round windows, doors and even settees . . . but we have had time to recover from the surfeit. We might well use it far more in all its forms.

It is not always easy to find an effective way of using pot plants indoors. Set on a table they often look out of proportion, and the question of suitable containers is always a problem. When, however, they

## FLOWER ARRANGEMENT

A striking example of *pot-à-fleur*. Cut flowers are put in jam jars on a tray among pots of house plants, or in metal containers lodged in the soil of the pots. Height is varied by putting some pots in holders and others on empty inverted pots. The flowers can be changed from time to time





A low fluted glass jar will offset a mixture of moss roses and geranium heads. Add a spray or two of forget-me-not by way of contrast

are arranged on the floor or on low stools, they can be put in shallow baskets or zinc-lined wooden trays. Then, as one looks down on them, one sees plant without an undue proportion of container—not always the case when they are arranged at a higher level.

#### IVIES

A good group of variegated ivies is *Hedera canariensis foliis variegatis*, with large

leaves beautifully marked in cream and green; and the smaller-leaved *H. helix* Glacier with white-margined, silvery-grey leaves. Being variegated, these plants need to be in a clearer light than others with entirely green leaves.

For a position with less light, there is nothing prettier than the small-leaved *H. helix* Chicago. Put it where it can be allowed to cascade, with all its grace and



vigour. It grows readily and likes reasonable moisture.

*Sparmannia africana* (African hemp): This is one of those obliging plants which, if treated reasonably, will flourish permanently indoors. It will grow to as much as 6 or 8 ft. in height and bears large pale green leaves and, now and then, will even produce delicate white flowers.

All through the long and cold winter, I have a group of foliage plants set apart on a small, low table. It has proved an effective and economical means of making the room look alive.

The top of the table is protected by a tray, fitted with a specially-cut, thin sheet of metal. Pot holders and empty, up-turned plant pots were used to give variations in height, so that the whole outline was graceful.

The plants used included a tall *Monstera deliciosa borsigiana*, *Scindapsus aureus*, *Philodendron scandens*, *Hedera canariensis foliis variegatis*, a dark red *Begonia rex*, a silvery-leaved scented geranium (*Pelargonium crispum variegatum*), trailing ivy and tradescantias.

The whole effect was lightened and enhanced by a trick. Among the plants I concealed a tallish glass vase, and towards the front I concealed a jam pot. In these two containers I put a few cut tulips, a few stems of clivia—whatever suitable cut flowers came my way.

### FIRST AID FOR FLOWERS

What there is to say about this, might well be written in Catherine wheels of fire—or emphasized by any known device that might make it register.

Beginners, particularly, are negligent about the matter of filling up vases—to me a sin in the category of forgetting to fill up the drinking trough of a canary.

Here then is the drill: As soon as the flowers are arranged, the vase should be filled to the brim. If the vase is a capacious one, the water will probably not need replenishing till the next day. But shallow or over-full vases should be inspected a few hours after being arranged. After that, water should be added up to the brim each day. In cold weather, warm water may be used.

All cut flowers should be protected from draughts and kept as far as is reasonably possible from radiators and fires, especially gas and electric ones.

I find that with nearly all flowers it is best to cut them the day before they are required. If they are then put into deep bowls of water in a cool place, it enables them to absorb a good deal of water before they are exposed to handling and warm rooms.

Just after they are picked, and before they are put into water, flowers must be treated according to their needs:

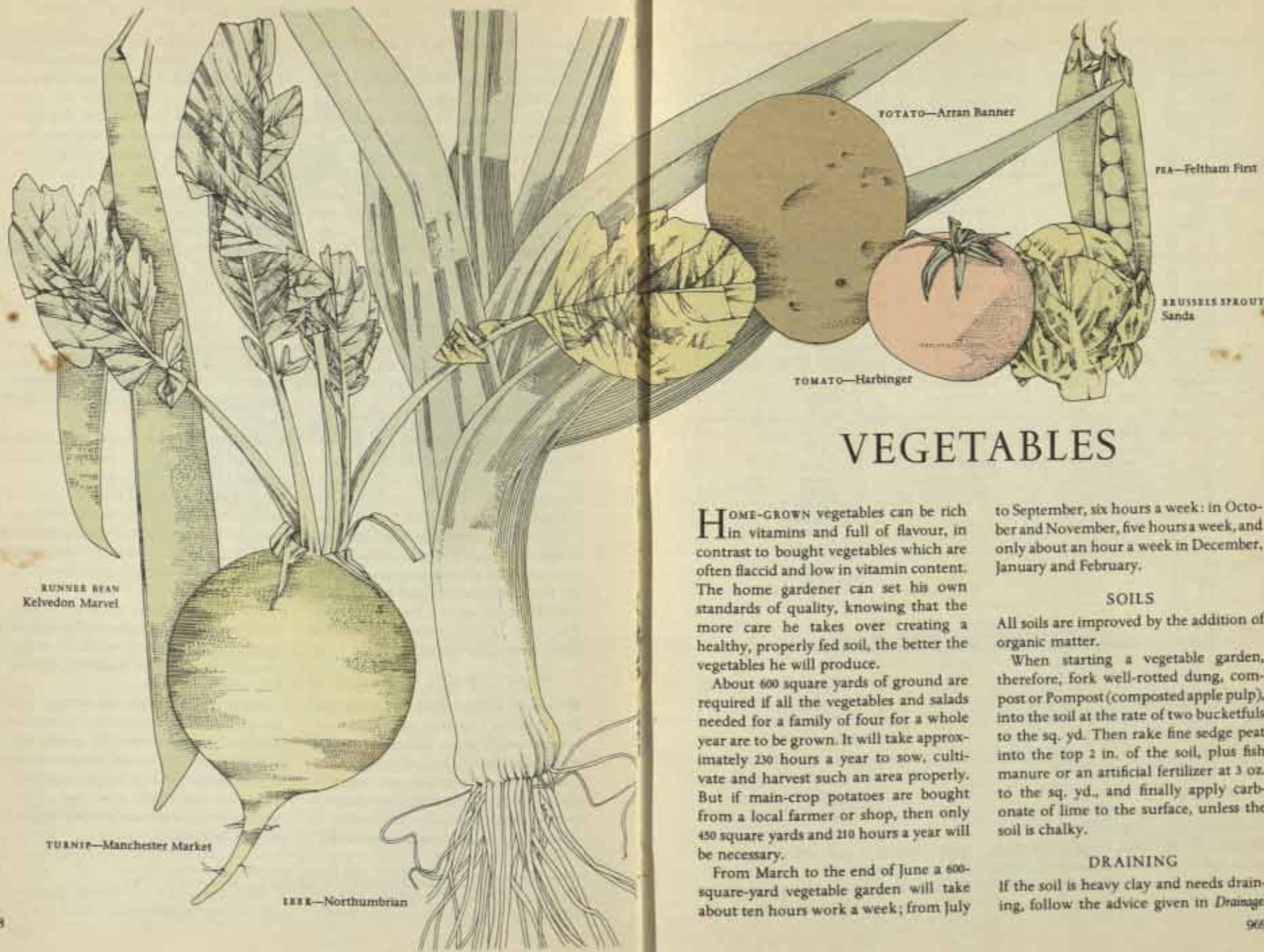
Hard-wooded plants must be enabled to absorb enough water to keep alive, so peel or crush the tips of their stems, or split them for three or four inches. This applies in particular to fruit blossoms and lilac.

Soft-wooded stems, such as poppies and dahlias, may be sealed up by dipping their tips into boiling water for a few seconds. I have seen bluebells, treated this way, last a week.

Some flowers, like mignonette and stocks, foul the water quickly. So remove any leaf which touches the water, and put a lump of charcoal into the vase.

Wild flowers should be picked in bud, carefully rolled in newspaper, then revived in hot water and given a night in a cool, dark place.\*

\* An alternative is to put the flowers in a polythene bag as soon as they are picked. In this way they will remain fresh. Ed.



## VEGETABLES

**H**OME-GROWN vegetables can be rich in vitamins and full of flavour, in contrast to bought vegetables which are often flaccid and low in vitamin content. The home gardener can set his own standards of quality, knowing that the more care he takes over creating a healthy, properly fed soil, the better the vegetables he will produce.

About 600 square yards of ground are required if all the vegetables and salads needed for a family of four for a whole year are to be grown. It will take approximately 230 hours a year to sow, cultivate and harvest such an area properly. But if main-crop potatoes are bought from a local farmer or shop, then only 450 square yards and 210 hours a year will be necessary.

From March to the end of June a 600-square-yard vegetable garden will take about ten hours work a week; from July

to September, six hours a week; in October and November, five hours a week, and only about an hour a week in December, January and February.

### SOILS

All soils are improved by the addition of organic matter.

When starting a vegetable garden, therefore, fork well-rotted dung, compost or Pompost (composted apple pulp), into the soil at the rate of two bucketfuls to the sq. yd. Then rake fine sedge peat into the top 2 in. of the soil, plus fish manure or an artificial fertilizer at 3 oz. to the sq. yd., and finally apply carbonate of lime to the surface, unless the soil is chalky.

### DRAINING

If the soil is heavy clay and needs draining, follow the advice given in *Drainage*.



## VEGETABLES

FIRST YEAR	Peas Beans Celery Leeks Lettuces Spinach Tomatoes Onions	Carrots Beetroots Swedes Parsnips Potatoes Turnips	Cabbages Brussels sprouts Broccoli Cauliflowers Kale
FERTILIZERS TO USE	Compost Fertilizer	Fertilizer Lime	Compost Lime
SECOND YEAR	Cabbages Brussels sprouts Broccoli Cauliflowers Kale	Peas Beans Celery Leeks Lettuces Spinach Tomatoes Onions	Carrots Beetroots Swedes Parsnips Potatoes Turnips
FERTILIZERS TO USE	Compost Lime	Compost Fertilizer	Fertilizer Lime
THIRD YEAR	Carrots Beetroots Swedes Parsnips Potatoes Turnips	Cabbages Brussels sprouts Broccoli Cauliflowers Kale	Peas Beans Celery Leeks Lettuces Spinach Tomatoes Onions
FERTILIZERS TO USE	Fertilizer Lime	Compost Lime	Compost Fertilizer

### A THREE-YEAR ROTATION PLAN

A plan for the smaller garden. Any form of crop rotation reduces the incidence of soil-borne diseases and pests

### CROP ROTATION

Ground which is repeatedly used for growing vegetables of the same nature deteriorates after a few seasons. A rotation system, which changes the use of the land each year, is good for both the soil and the crops. One crop can leave the ground in a better condition for another, because of the feeding it has received and because of the useful elements it may have left in the soil. Also, some plants excrete toxins which can accumulate and become harmful to that crop but not to

others. A rotation system ensures a regular working of the land in a systematic manner, and balanced feeding for the soil, as each section will be given manure, lime or fertilizer in turn. Any form of rotation also reduces the incidence of soil-borne pests and diseases.

For a simple rotation system, divide the vegetable garden into four equal plots. In the first year, one part might be used for members of the cabbage family (brassicas), the second for potatoes, the third for root crops and the fourth for



# VEGETABLES

FIRST YEAR	Cabbages Brussels sprouts Cauliflowers Kale Broccoli Turnips Lettuces Savoy	Early potatoes Main-crop potatoes Onions Celery Leeks	Carrots Beetroots Shallots Salsify Chicory Parsnips Swedes	Peas Broad beans Dwarf beans Runner beans Tomatoes Spinach
FERTILIZERS TO USE	Compost Manure Lime	Compost Manure Fish manure	Fish manure	Compost Manure Fish manure Wood ash
SECOND YEAR	Peas Broad beans Dwarf beans Runner beans Tomatoes Spinach	Cabbages Brussels sprouts Cauliflowers Kale Broccoli Turnips Lettuces Savoy	Early potatoes Main-crop potatoes Onions Celery Leeks	Carrots Beetroots Shallots Salsify Chicory Parsnips Swedes
FERTILIZERS TO USE	Compost Manure Fish manure Wood ash	Compost Manure Lime	Compost Manure Fish manure	Fish manure
THIRD YEAR	Carrots Beetroots Shallots Salsify Chicory Parsnips Swedes	Peas Broad beans Dwarf beans Runner beans Tomatoes Spinach	Cabbages Brussels sprouts Cauliflowers Kale Broccoli Turnips Lettuces Savoy	Early potatoes Main-crop potatoes Onions Celery Leeks
FERTILIZERS TO USE	Fish manure	Compost Manure Fish manure Wood ash	Compost Manure Lime	Compost Manure Fish manure
FOURTH YEAR	Early potatoes Main-crop potatoes Onions Celery Leeks	Carrots Beetroots Shallots Salsify Chicory Parsnips Swedes	Peas Broad beans Dwarf beans Runner beans Tomatoes Spinach	Cabbages Brussels sprouts Cauliflowers Kale Broccoli Turnips Lettuces Savoy
FERTILIZERS TO USE	Compost Manure Fish manure	Fish manure	Compost Manure Fish manure Wood ash	Compost Manure Lime

**A FOUR-YEAR ROTATION PLAN**  
This plan ensures that no type of vegetable is  
grown on any plot more than once in four years

peas and beans. Annual rotation will then mean that no class or type of vegetable is grown on any one area of ground more than once in four years.

In small gardens a three-course rotation will give similar benefits.

#### CATCH CROPS

A vegetable crop grown between the harvesting of one main crop and the planting of another is known as a "catch crop". Leeks, for instance, are not ready to be planted out until June, and the site could be sown with a catch-crop of broad beans in November for harvesting in June before the ground is needed for the leeks.

Quick-growing crops, such as lettuce, spinach and radish, are usually grown as catch crops. If sprouting broccoli, which is harvested in March, is to be followed by runner beans (which cannot be sown until the soil is warm, in late April or early May) the ground can be cropped with lettuces, radishes or spinach. But always be sure to sow a crop which is quite certain to be ready for harvesting before the main crop should be put out.

Catch crops can also be sown at the same time as parsnips and parsley which are both very slow to germinate. The catch crop will have the added advantage of marking the position of the rows for hoeing.

#### INTER-CROPS

A crop grown between the rows of another is known as an inter-crop. If winter lettuces are planted out in October as an inter-crop, broad bean seeds can be dibbled between them in November. Broad beans may also be sown as an inter-crop with early potatoes. The beans get away earlier than the potatoes and, because they grow upright, do not interfere with the tuberous crop.

The ridges formed by digging out celery trenches can also be used for inter-crops. On the top of these ridges sow the seed of lettuces, french beans or radishes.

These can all be harvested before the soil is needed for earthing up the celery itself.

## SOWING

#### PREPARATION OF THE SEED BED

Seeds need to be sown in firm soil. Start by forking over the bed about 3 in. deep, adding one bucketful of fine sedge peat to the square yard to supply organic matter and moisture to the roots of the seedlings after they start to grow. Tread the land over to break up the lumps of soil and make it firm. Then rake the top inch of surface soil backward and forward until every particle is finer than a grain of wheat, and the surface is level.

If the soil is very lumpy, it may be necessary to repeat the treading and raking. But the process is effective only when the soil is dry and crumbly. After rain, wait until the soil dries out again sufficiently for the work of "pulverizing" to be continued.

#### QUANTITY OF SEED

Many gardeners sow far too much seed. In a  $\frac{1}{4}$  oz. of parsley, for instance, there are nearly 4,000 seeds; as one plant can easily grow 1 ft. across,  $\frac{1}{4}$  oz. of seed could sow a row 4,000 ft. long. Follow the instructions given for individual vegetables.

#### SEED SOWING

Grow the vegetables in rows because it is then easier to keep down the weeds with a hoe.

The depth of the drill will depend on the size of the seed—the smaller the seed the shallower the drill, and the heavier the soil the shallower the drill. In average soils, drills  $\frac{1}{2}$  in. deep suit the seeds of carrots, lettuce and parsley; 1-in. deep drills suit beetroot, spinach and swedes; drills 3 in. deep suit peas and beans.

#### STATION SOWING

Instead of wasting seed by trying to sprinkle it evenly and thinly along the drill, it is better in some cases to sow three seeds at each of the spots or stations

**MAKING A DRILL**

The depth of the drill depends on the size of the seed. Vegetables are grown in rows to save space and labour

**STATION SOWING**

Sow a number of seeds at regular intervals and later, if all the seeds germinate, thin the seedlings to one per station

where the plants are to grow. For instance, if beetroot are to be grown 4 in. apart in the rows, place the seeds at stations 4 in. apart along the drills; then, later on, if all the seeds germinate, the seedlings can be thinned down to one per station.

The saving of seed is enormous. It is possible to buy a packet containing 1,500 seeds of James' Scarlet Intermediate carrot for a few pence. If as many as five seeds are sown at stations 5 in. apart along the drill, the one packet will suffice for 300 stations in a row 125 ft. long.

**SEED SELECTION**

When buying seed the strain should be taken into account. A high-quality strain is the result of saving seed from plants of particular merit—some experts consider that strain is often more important than variety. It is therefore important to buy from a reliable seedsman who has taken trouble over selection. As some seedsmen tend to specialize in particular groups, it may be advisable to buy the

seeds of peas and beans from one firm, seeds of the cabbage family from another firm, and the seeds of root crops from a third. Always be prepared to pay a good price for good seed. It is well worth it.

**TREATING THE SEED**

Seeds are often attacked by spores of a soil-borne fungus which kills them just as they are germinating. This is usually called pre-emergence rot, but can be due to various fungi. The trouble is more common in heavy soils than in light ones and occurs frequently when seeds are sown in moist soil, especially in the autumn or very early spring. Before sowing, treat the seeds with thiram or one of the proprietary organo-mercury dusts, which are obtainable from horticultural sundriesmen.

Peas and beans are particularly subject to these rotting-off troubles and experiments have shown that natural germination can easily be increased by 100 per cent when the "coats" of the seeds are treated with a fungicide dust. This can be done



either by putting about a mustard-spoonful of the dust in a half-pint packet of peas and sealing and shaking the packet, or by using one of the special puffer packs now available. The nose of the puffer is inserted into the corner of the seed packet and the dust is puffed over the seeds. The hole is closed with the thumb and forefinger and the fungicide and the seeds are shaken up together.

#### SEEDS FROM COMPOST-GROWN PLANTS

Those who decry the use of chemical fertilizers use seeds from plants that have been grown on properly manured soil; they claim that the health of the parent plants can be passed on to the seedlings. Certain seedsmen, therefore, sell compost-grown seeds.

#### CHITTING SEEDS

When sowing seeds in very dry weather and when the soil is dry, chitting—a process to encourage germination—is often used with smaller seeds such as carrots. Space the seeds out on an enamel plate and spray the seeds with water once a day through a scent spray. If the seeds are kept in a warm room, such as a kitchen, they germinate quickly. The

moment rudimentary roots appear, sow the seeds. Far fewer losses result but, because the baby roots are easily knocked off, the seeds are much more difficult to handle while sowing.

Another method of encouraging germination is to water the seed drill thoroughly through the fine rose of a can, allowing 2 gal. for a 5-ft row. After the drill has been soaked, the seed may be put in. Because of the quantity of water needed and the time taken by this method, some gardeners prefer to soak the seeds in water before sowing. Germination is consequently quicker and the resulting crops are often better. This method is particularly useful in the case of large seeds like peas and beans.

#### COVERING THE SEED

Whether the seeds are sown by station sowing or continuously along the drill, firm the ground over the seed once it has been covered. As soon as the seeds are sown, rake lightly over the drill or use the back of the rake to fill in the drill with soil. Then firm. Hold the handle of the rake vertically and work up the row pressing the soil down over the seeds with



#### THINNING OUT SEEDLINGS

Thin out the seedlings as soon as they are large enough to handle. Make sure that the ground is wet before thinning, and afterwards firm the soil to discourage egg-laying flies

the rake. Because this firming leaves a slight depression where rain-water may collect, draw the rake over the drill to disturb the top  $\frac{1}{4}$  in. of soil and thus leave the surface fine and level.

### THINNING

Thin out any plants which appear to be growing too thickly together. This is best done after a shower or, if the weather is dry, after a good watering. Do the thinning as early as possible—just as soon as the plants are big enough to handle—so as not to damage the roots of the plants that remain.

Sometimes the thinning of plants attracts pests; this is particularly true of carrots and onions. It is important, therefore, never to leave any thinnings lying about on the surface of the ground, because their smell attracts flies. Firm the ground on either side of the rows after thinning, because this helps to prevent the flies from burrowing down and laying their eggs.

### PLANTS AND PLANTING

Plants of the cabbage family, celery, cucumbers, leeks, marrows, sweet corn and tomatoes are usually raised either in seed beds out-of-doors, in boxes in the greenhouse, in frames or under Dutch lights, but sometimes it may be impossible to grow from seed all the plants required for the vegetable garden. Seedlings can then be bought from a reliable nurseryman. Warn the nurseryman the day before the plants are required so that he can see that his seed bed is watered and that the plants are in the proper condition. Be sure to have the strip of land prepared so that planting can be done as soon as possible.

If the plants have to come from a distance, ask that they be packed carefully, preferably with the roots in damp moss. When they arrive, unpack them at once

and then stand them up to their "necks" in a bucketful of water for a couple of hours before planting. If possible do the planting in the evening so that the plants have a cool night to get over the shock. If they have to be planted in the day, shade them from hot sun.

Buy plants which are sturdy and have dark green leaves; do not take plants that have been forced and are therefore tender, long and lanky. It is particularly important not to use spindly tomato plants. Do not buy large lettuce and cauliflower plants, as it is the small ones that usually transplant easily. With any members of the cabbage family, watch out for swellings on the roots which may mean that they are infected with club root disease. Such specimens would infect the soil.

All plants should be examined for insect pests, for any damage that may have been done with hormone sprays, which cause the leaves to curl and twist, and for fungus diseases like mildew, which looks like a white powdery down on the foliage.

### PLANTING

However the plants have been produced—in the open, or in boxes or pots in the greenhouse—disturb the roots as little as possible when planting out. Although cabbages or savoys will withstand bad treatment, cauliflowers and broccoli tolerate only the minimum of root disturbance and should not be planted too deeply; otherwise they will go blind—that is, they will not produce white curds.

With some seedlings (such as egg plants, marrows, cucumbers, tomatoes and sweet corn) it is as well to keep a good ball of soil at the base of the plant, covering the roots. By planting this ball of soil carefully, the seedlings will be subjected to the minimum of disturbance. There are soil-block machines



which make square or hexagonal blocks of soil, 3 in. or so across, in which the seedlings can be raised. At planting time the whole of the soil block is put out, and the plants growing in them therefore transplant perfectly. Soil blocks are best made with John Innes potting compost.

It helps if, at transplanting time, the leaves of the seedlings are really turgid—firm and saturated with moisture. It is important, therefore, to water the seed bed thoroughly the day before lifting the plants.

If the weather is very dry, make a V-shaped drill 3 in. deep where the plants are to grow and plant along the bottom of it. Thus protection will be given against surface winds. It will also help to cut in half (with a sharp knife or a large pair of scissors) the leaves of plants that have a large leaf area.

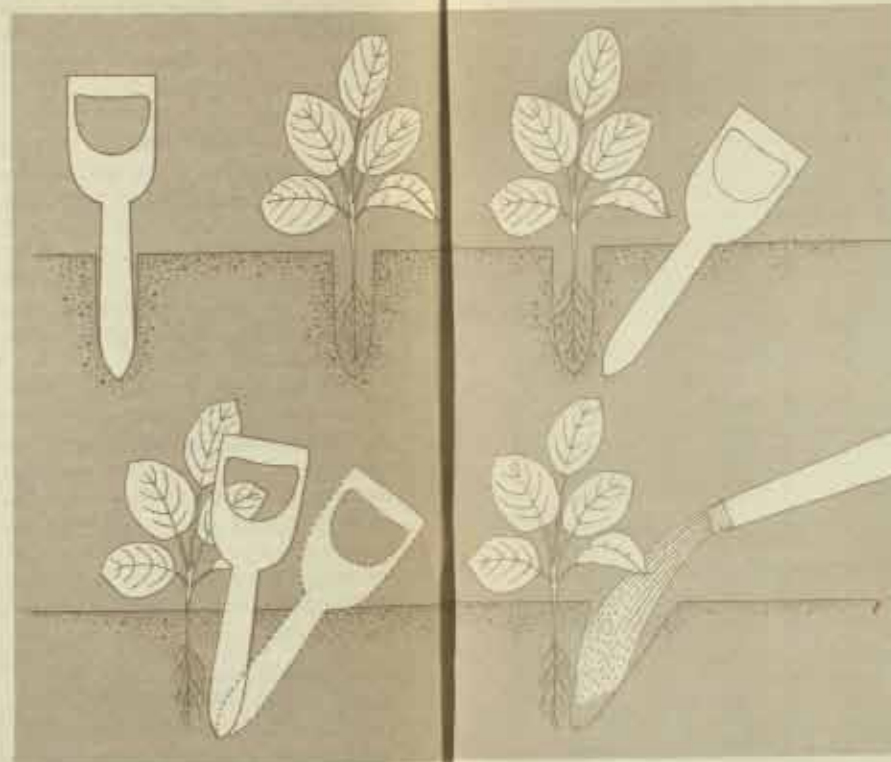
In very hot weather, shade the plants by fastening sacks over them on stakes for a few days. Important plants such as cauliflowers can be given daytime protection from hot sun by inverting flower pots over them. Remove the pots in the evening so that the leaves of the plants will receive the evening and morning dews, and remove the pots altogether after four or five days, when the plants should have produced fine root systems. Instead of pots, large leaves, like those of rhubarb, may be used as "parasols".

When using a dibber for planting out seedlings of the cabbage family, make perpendicular holes large enough to receive the roots of the plants.

Afterwards put in the roots, make a hole at an angle of 40 to 50° at one side of each plant and lever upward. This will firm the roots at the base of the stems, leaving a depression at the side of the plant. This may be filled with water at planting time if necessary and again three or four days later.

Tomatoes, cucumbers and sweet corn

#### HOW TO USE A DIBBER



Make a perpendicular hole large enough to hold the plant's roots, then make a hole at an angle of about 40° at one side of each plant and lever upward to firm

are best planted with a trowel, so that good holes can be made for their large roots, and firming can be done with the handle of the trowel.

For leeks, make perpendicular holes with a long dibber or crowbar, drop the plants into the holes and pour in a little water. No firming is required.

#### THE PERMANENT CROPS

There are a few crops grown in the vegetable garden (asparagus, Welsh onions,

cold winds can act on it. It will then be easy to fork down lightly and rake level in the spring.

Any subsequent feeding will need to be done from above and the worms will pull the fine organic matter into the ground. In addition to compost, give an organic fertilizer such as a fish manure each year, in February or early March, at 3 to 4 oz. to the sq. yd.

Do not plant permanent crops in the middle of the vegetable garden where they will be in the way; put them on their own, perhaps on a narrow strip of land at one end of the plot.

#### THE DANGER OF DROUGHT

It is impossible to grow succulent vegetables unless there is sufficient moisture in the soil. Crisp and succulent vegetable crops are grown quickly in soil rich in humus and containing sufficient moisture. Lack of moisture in the soil lowers the sugar content of the plants and causes them to become bitter and leathery. But during almost the whole of the period in which vegetables grow best, the rainfall is normally at its lowest.

#### WATERING

At this important dry period of the year, a watering-can is an inefficient tool. The amount of water it supplies is negligible and is soon dried up by the sun and carried away by the wind. The problem with a garden hose is that the water comes down with too much force: seedlings may be washed out of the ground and the surface can easily be panned down.

An apparatus can, however, be attached to the end of a hose, which will throw the water up high into the air to reach the plants, as near as mechanically possible in the form of rain. Whirling sprinklers do this work adequately, but the area they cover is circular—and vegetable gardens are not usually that shape. The

the roots. If necessary, fill the depression left at the side of the plant with water both at the time of planting and again a few days later during very dry periods

rhubarb) that are permanent—they remain in their original position for a number of years. Crops like these cannot be included in any rotation plan.

The soil in which they are to be planted is first heavily manured by digging in old dung or well-rotted compost, at the rate of two 2-gal. bucketfuls to the sq. yd. There is no need to dig deeper than a spade's depth and if this work can be done in October or early November, the soil may be left rough so that frosts and



## FACTS AND FIGURES ABOUT VEGETABLE SEEDS

<i>Vegetable</i>	<i>Average number of seeds per ounce</i>	<i>Average days to germination</i>	<i>Average life in years</i>	<i>Average days to mature from sowing</i>
ASPARAGUS	1,000	25	3	(3 yrs.)
BEETROOTS	1,600	13	4	60-80
BROCCOLI	9,000	8	4	270-450
BRUSSELS SPROUTS	7,000	8	4	100-120
EARLY CABBAGES	6,000	8	4	70-90
LATE CABBAGES	6,000	8	4	90-130
CARROTS	14,000	16	3	75-100
CAULIFLOWERS	10,000	8	3-4	65-120
CELERIAC	50,000	18	2-3	120-150
CELERY	50,000	16	3	120-150
CHICORY	15,000	9	3-6	120-150
CUCUMBERS	1,000	9	3-5	70-90
ENDIVE	12,000	8	2-5	90-120
KALE	7,500	8	3-5	200
KOHL RABI	7,000	7	4-6	80-100
LEEKs	8,000	9	2-4	100-200
LETTUCES	16,000	7	4-6	60-90
ONIONS	8,000	9	2	130-150
PARSNIPS	6,000	17	1	125-150
PEAS	90-150	13	3-5	60-80
RADISHES	4,000	6	3-6	20-40
SALSIFY	4,000	12	2-3	130-170
ROUND SPINACH	2,500	11	3	40-50
NEW ZEALAND SPINACH	350	11	3	70-80
SWEDES	7,000	8	4-6	150
TOMATOES	12,000	10	3-5	100-130
TURNIPS	9,000	8	4-6	50-80

vegetable garden needs a "square-area rainer", a device fitted on an iron stand about 3 ft. high to the end of the hose. The water passes through a "rain fan" which moves backward and forward slowly so that artificial rain first covers the ground on one side of the fan and then on the other side.

A  $\frac{1}{2}$ -in. hose with a square-area rainer attachment and with a mains pressure of 30 lb. per sq. in. will cover an area of 60 sq. ft. This appliance saves a tremendous amount of time and can ensure that the vegetable crops receive the water they need in the right way.

The amount of water that has to be given depends on the season, on the crop and on the soil. Dry, sandy soils may need twice as much water as heavy, clay soils. Artificial rain will need to be given regularly in a dry summer and perhaps only occasionally during a showery summer season. In a loamy soil garden (loam is about half clay and half sand) water once a fortnight, and aim to give a quarter of an inch each time. Efficient square-area rainers should deliver  $\frac{1}{2}$  in. of artificial rain an hour.

On light, sandy soils it will probably be necessary to give  $\frac{1}{2}$  in. of water

once a week, especially in cases where quick-maturing crops like spinach, radishes and lettuces are being grown. Whether the soil is light or heavy it is important to ensure that organic matter has been added, for artificial rain is most useful when there is ample humus.

If a strip of ground becomes vacant in the summer because a crop has been harvested, water this strip thoroughly before it is cultivated again. Prepare the soil an hour or so later, and on the following day it should be possible to sow the seed or plant out the seedlings of the new crop. Do not wait too long or the benefit of watering will be lost.

Shallow-rooting crops naturally suffer far more in a dry summer than deep-rooting ones. Concentrate, therefore, on watering lettuces, spinach, radishes, spring onions, early potatoes, turnips, cauliflowers, celery and celeriac. It is also a good thing to water the plants of cabbage, broccoli and sprouts while they are still in their seed beds.

It is not true that the leaves of plants will be scorched if artificial rain is given on a bright, sunny day.

Scorching can take place if a watering-can is used on the leaves of plants when the sun is bright; this is because large drops of water act as a lens or "burning glass" which causes the sun's rays to burn. But if the drops of water are thrown well into the air they break up into very tiny droplets which are "aerated" and do not cause scorching because they wet the leaves evenly.

Never wet the leaves of plants without ensuring that the ground is moist at the roots.

When artificial rain is used properly there is much less trouble from insect pests and fungus diseases. When very wet, the "pores" of leaves are open to the greatest extent; disease spores can get in, and aphids and mildew can attack more

readily. When the surface soil is dry, earthworms, which improve the fertility of the top few inches of soil, and are most useful to vegetables, burrow down deeply.

It must be borne in mind that overhead irrigation tends to leach plant foods and lime out of the soil, so it should not be overdone. Plant foods can easily be replaced by careful fertilizing and manuring.

### EFFECT OF CLIMATE

A very large number of vegetables can be grown in British gardens. Some, like cabbage, are easy to grow, while others, such as celery, need more complicated management.

In the south, and more particularly in the south-west, it is usually possible to sow and plant much earlier than in the north and north-east. The difference may be as much as two or three weeks.

The suggested times of sowing and planting given under the headings of individual vegetables are average ones for the Midlands, except in the cases where specific times for north and south are given.

It is not, however, always a question of north versus south. There are sheltered parts of the north-west, round Cheshire and Flintshire, which are much earlier than more exposed parts round the east coast of Norfolk. There are some very warm, sheltered spots on the west coast of Scotland affected by the Gulf Stream. The vegetable gardener should therefore time sowing and planting to suit his own district.

Times of sowing will also vary because of the season itself. In some years there are serious frosts as late as the beginning of June, and there are seasons when there is early summer warmth in March. It is therefore necessary to make common-sense decisions.

## ARTICHOKES

There are two kinds of artichoke, globe and Jerusalem. The globe is a perennial and has a thistle-like head, with scales surrounding a fleshy frond or heart, which is the part with the most flavour.

The Jerusalem artichoke is grown for its tubers, which are produced in the soil like potatoes. Although it also is a perennial, the Jerusalem artichoke is more conveniently grown by digging up the tubers each season and replanting the best specimens the following year, as in the case of potatoes.

### GLOBE ARTICHOKES

#### SOIL PREPARATION

Do not attempt to grow artichokes unless the soil is well drained. It should be moist in the summer and dry in the winter. Choose a sunny position because the unopened flower heads have more flavour when they come from plants that have had direct sunlight. As the flower-bearing stems grow tall and are easily blown over, they should be sheltered from winds.

In the autumn dig the ground over to a spade's depth, incorporating old dung or well-rotted compost at the rate of a bucketful to the sq. yd. and leave the ground rough. If the soil is a heavy clay, frost will help to break it down. Fork the ground level in the spring, adding a fish manure or a meat and bone meal at 3 oz. to the sq. yd. (Give a similar dressing late in March or early in April each year.)

#### PLANTING

It is not advisable to raise plants from seed because there is then too much variation in the size and flavour of the flower heads. Buy plants of a good variety from a reliable nurseryman; and increase the stock vegetatively by severing the side growths

(suckers) which develop from the base of the plants each year.

Cut them from the parent plants when they are 9 in. long, taking care to see that there is a piece of the old plant's root at the base. Plant out these suckers in the second or third week of April in rows 3 ft. apart, allowing 3 ft. between the plants. Make holes with a trowel to take the complete root and about an inch of the sucker itself. Firm well and, if the ground is dry, give a good watering afterwards.

In the north of England and in Scotland, or areas that have particularly hard winters, cut off the suckers early in November and pot them up individually into 6-in. pots, which should then be protected from frosts in a cold frame. Late in May, when all fear of frosts has passed, carefully knock the plants out of their pots and set them out as described above.

#### GENERAL CARE

If the artichokes are not growing sturdily by early June, top dress with dried blood or a complete fertilizer at 2 oz. to the yard run.

During the summer use the Dutch hoe lightly in between the plants to keep down weeds and to create a dust mulch—that is a  $\frac{1}{2}$ -in. layer of loose soil all over the surface of the ground. Early in November give some protection to the plants against frost: loose straw can be placed over each specimen, to form a kind of Red Indian tepee, and removed in April. If the straw gets absolutely sodden during the winter it should be replaced. Dry bracken lasts longer and gives even better protection than straw.

Good artichoke plants have been known to last 12 years or more, but it is



safer to make a new bed every five or six years or, better still, to replace whole rows one at a time; this ensures that good globe artichokes are available every year.

#### HARVESTING

No large flower heads are produced the first year. In the early summer of the second year, the large thistle-like heads at the ends of the stems should be cut just before they open. Cut the main head, known as the king head, at the end of each stem first. Secondary growths will then develop, each of which will produce a tender flower head which should be cut when it is about the size of a large hen's egg.

It is advisable to cut globe artichokes an hour before cooking.

#### RECOMMENDED VARIETIES

Green Globe, the variety usually grown in Britain. May be raised from seed.

Gros Camus de Bretagne, produces large delicious flower heads. Not completely hardy and must, therefore, have protection.

Gros Vert de Laon, a medium-sized variety that does well in the north.

Purple Globe, similar to Green Globe, with purple-tinged heads.

### JERUSALEM ARTICHOKE

These tuberous-rooted vegetables are not easy to prepare for the table because the tubers are knobbly. There is, however, a new variety which has quite smooth tubers, like those of a dahlia. Because the stems will grow 7 ft. high, Jerusalem artichoke plants can be used as a hedge or wind-break at the end of the garden.

#### SOIL PREPARATION

Jerusalem artichokes will not grow well in sodden, undrained land; they prefer a dry, warm, well-drained position, although they often crop well on ground where other vegetables have failed. To

produce large tubers, dig in well-rotted manure or compost at the rate of a bucketful to the sq. yd. At the time of planting, apply a fish manure or a meat and bone meal fertilizer at 2 oz. to the sq. yd. To supply extra potash, apply wood ash, if available, at 5 oz. to the sq. yd. or sulphate of potash at 2 oz. to the sq. yd.

#### PLANTING

In March or early April, plant tubers about the size of hen's eggs using, in the case of the ordinary varieties, those which are as smooth as possible. The less knobbly the tubers, the less knobbly will be the crop. For the smooth variety, plant tubers that are about  $\frac{1}{2}$  in. across and 2 in. long.

Using a draw hoe against a tightly stretched line, take out a furrow 6 in. deep and spread well-rotted manure or compost evenly along the bottom. Plant the tubers 1 ft. apart in the furrow and then use the draw hoe again to cover them, leaving a ridge about 2 in. high over the top. Sprinkle the organic fertilizer along the row at this stage, taking care that the fish manure does not fall on the tubers. If more than one row of artichokes is planted, make the rows 3 ft. apart.

#### GENERAL CARE

When the plants are 1 ft. high, use a draw hoe lightly over the surface to draw the soil up to the plants. Do this every fortnight or so and until the rows are earthed up 6 in. or more. Because the artichokes grow so tall it is advisable, in a windswept situation, to drive a 6-ft. stake into the ground at each end of each row, and to run wires from both sides of the stakes. The stems can then be kept inside these parallel wires, to prevent them from blowing over and exposing the tubers.

By the end of October the great bulk of the tubers will have been made and the

## VEGETABLES



GLOBE ARTICHOKE—Green Globe



JERUSALEM ARTICHOKE—New White

tops can be cut down to within 2 ft. of soil level. Chop up the tops with an axe and put them on the compost heap to rot down.

### HARVESTING

The tubers of Jerusalem artichokes are quite hardy and can be left in the ground until they are needed in the winter. But frozen soil makes it difficult to lift them, so dig up the tubers carefully at the end of November and put them in a heap 3 ft. wide by 3 ft. high and cover them first with 6 in. of straw and then with 6 in. of

soil. Small quantities of tubers can be put in boxes with sand or sedge peat for storing in the potting shed or outhouse.

When harvesting the crop take care that every tuber, however small, is dug up or the artichoke may become a "weed" the following year.

### RECOMMENDED VARIETIES

Fuseau, a variety with beautifully smooth tubers, usually smaller than the more knobby kinds.

New White, a pure white strain of the old, purple-eyed kind.

## ASPARAGUS

This delicious vegetable used to be grown in special beds and was generally considered difficult. Although asparagus still requires some special treatment, its cultivation has been made quite simple by the genetical breeding of Captain A. W. Kidner who, during the last 15 years, has produced a heavy-cropping, easy-to-grow strain known as K.B.F. Buy "pedigree" crowns, even though they are dearer.

### SOIL PREPARATION

Asparagus prefers a sandy soil or even a sandy loam, as these warm up quickly in the spring because of their low moisture content. Thus the plants are stimulated into growth, and the asparagus sticks can be cut early. Asparagus can be grown successfully on heavy clay, provided that the drainage is good, but the crop may be a fortnight later than one from a warm sandy loam.

Some protection should be given against cold north-east winds, either by planting a permanent hedge or by erecting a roll of sacking 4 ft. high on posts each February. The sacking may be taken down in July.

Prepare the ground by digging to a spade's depth in the autumn and burying old dung or well-rotted compost at the rate of a large bucketful to the sq. yd. Leave the soil rough.

About the third week of the following March, fork over the soil 3 or 4 in. deep. Apply a fish fertilizer, with an analysis of about 6 per cent nitrogen, 6 per cent phosphates and 6 per cent potash, all over the ground at 4 oz. to the sq. yd. A similar dressing should be given at the same time each year until the asparagus bed is exhausted, which may be up to 20 years later.

Each October put down old dung or

good compost along the rows, allowing one large bucketful to each yard run. Do not dig this in but leave it on the ground as a top dressing.

The intended asparagus bed should be absolutely free from perennial weeds. On no account plant in soil known to be infested with docks, nettles, thistles or convolvulus. These should be eliminated either with a strong hormone solution or by adopting the double green manuring method (see *Composting and Green Manuring*).

### PLANTING

Asparagus roots are thick and succulent and so dry out quickly. Therefore, when the plants arrive from the nurseryman, soak them in water for a day and then put them out in the garden covered with damp sacks. Do not expose the roots to the air more than necessary.

Plant during the third week in March or early in April, as soon as the soil is dry and friable; do not plant when it is wet and sticky. It is better to put in one-year-old crowns, although they take a little longer to crop.

Cut trenches 6 in. deep and 6 in. wide, 3 ft. apart. Remove the plants from their damp sacks and plant them 2½ ft. apart, as quickly as possible, in the bottom of these trenches, spreading the roots out carefully so that they radiate evenly all round the crowns. Cover them with 3 in. of good soil, firming this with the back of the spade, and allow the trench to fill up gradually during the summer as hoeing proceeds. By October the ground should be level.

Allow the roots to get established the first year, and during the second year let the fern grow well so that good crowns are built up which will produce good shoots early the following season.



## GENERAL CARE

For the first two years, lightly hoe to keep down weeds, and apply manures and fertilizers. In early November, cut down the fern to within 1 in. of soil level with a pair of shears. In the third year, when the asparagus is to be cut, use a draw hoe early in March to make a ridge over each row about 5 in. high. The ridge should not be too steep; an angle of 45° is sufficient. The ridge helps to ensure a longer asparagus stem for cutting, and keeps the shoots white.

## HARVESTING

Cut the asparagus sticks 4 in. below the normal surface of the soil, using a long narrow knife or a special asparagus knife with a serrated edge, but do not cut so low that the crowns of the plants are damaged. Cut every two days in the early part of the season (usually early May) and every day when the weather gets warmer. Serve the cooked asparagus within two hours of cutting if possible.

Stop cutting early in June and leave any further stems to grow and produce asparagus fern. Cut the fern itself down to within 6 in. of soil level just before the berries ripen; if they are allowed to ripen and fall to the ground, useless seedlings which are difficult to eradicate will mask the effect of the carefully chosen "pedigree" crowns.

## ASPARAGUS BEETLE

Where the red and black asparagus beetle has attacked the foliage, leave about three stems of fern at the end of each row. The beetles that fell to the ground when the rest of the fern was cut will climb up the remaining stems where they may be killed with D.D.T. powder.

## RECOMMENDED VARIETIES

Argenteuil Early, delicate flavour and fine texture; not a very heavy cropper.

Connover's Colossal, good thick-stalked variety with slender, pointed buds.

K.B.F., the best heavy-cropping strain; sticks are large and delicious.

## BEANS

## BROAD BEANS

One of the oldest known vegetables, broad beans are easy to grow well. They are extremely hardy and the seed can therefore be sown in the autumn as well as in the spring.

## SOIL PREPARATION

Broad beans will grow in almost any soil, whether light or heavy.

Plant autumn-sown seeds in soil which was well manured for the previous crop. In addition, and before sowing, lightly fork a fish manure with a 10 per cent potash content into the ground at 3 oz. to the sq. yd.

Three weeks before spring sowing, dig well-rotted dung, fully rotted compost or Pompost into the ground to a spade's depth at the rate of one large bucketful to the sq. yd. When the soil is being made level and ready for seed sowing, rake fish

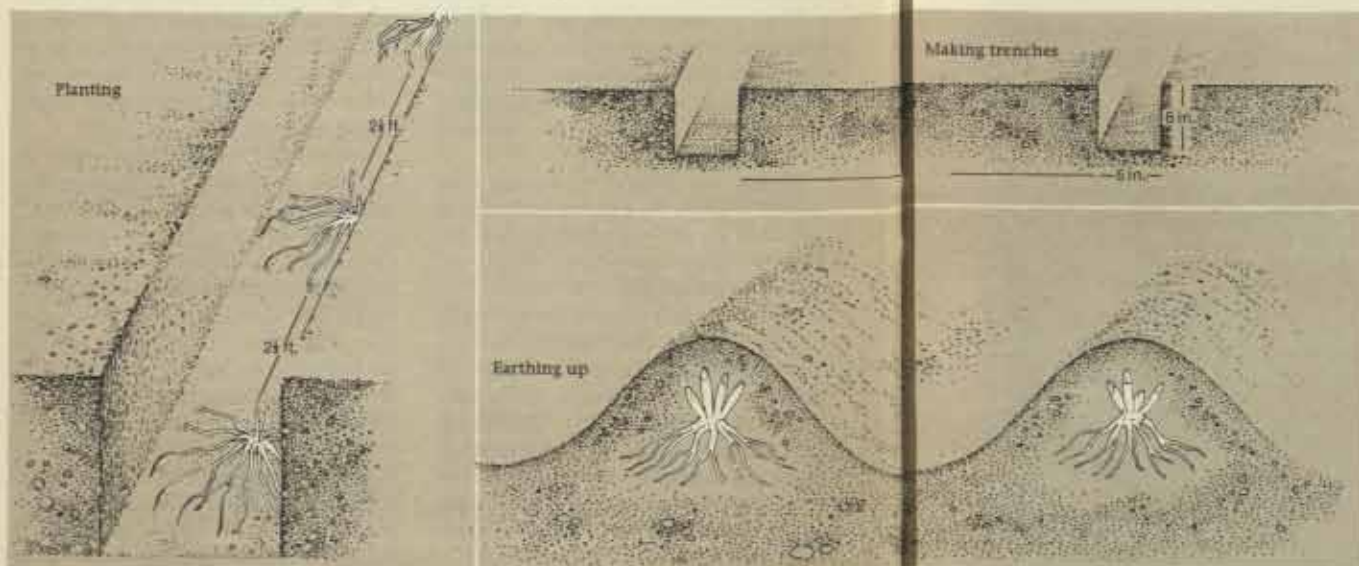
manure at 3 oz. to the sq. yd. into the top inch of soil.

The white-seeded Windsor types of broad beans have more flavour than the green-seeded long-pod types, but are not so hardy. In colder parts of the country it is best to rely on the long-pods only.

## SOWING

For an early crop, sow long-pods in November, making holes with the dibber 2 in. deep and 6 in. apart, and drop one bean into the bottom of each hole. Treat the beans first with a thiram dust to prevent pre-emergence rot. In the south, where the soil is not too heavy, a second sowing of long-pods can be made during the middle of February.

Where it is not advisable to sow out-of-doors in November, it is still possible to ensure an early crop. Seed of long-pods may be sown in boxes of Eclipse No-Soil or John Innes seed compost in a greenhouse or frame about the middle of December or early in January. The plants are then grown on under glass until about the third week of March when they can be planted out-of-doors 6 in. apart. Another method is to sow long-pods in January under cloches or ganwicks and then remove the glass early in April. For ordinary crops make the first sowing of long-pods or Windsors out-of-doors early in April and a second sowing for a late crop about the beginning



## PLANTING ASPARAGUS

After cutting the trenches, set the crowns in them, carefully spreading out the roots, and cover the crowns firmly with 3 in. of good soil. In the third year, make a 5-in. high ridge of soil over each row to blanch the stalks.

## VEGETABLES

of May. On a dry day, having raked the soil level and given a fish manure, use a draw hoe to take out a drill 3 in. deep. Space the beans out 8 in. apart in the drill. Take out another drill 8 in. away and sow seeds in it, also 8 in. apart. This is known as the double row method. Plant the next double row 2½ ft. away.

Sow dwarf varieties in drills 6 in. apart in double rows, with 6 in. between the rows, and the next pair of double rows 2 ft. away.

In both cases it is advisable to sow 12 seeds in a group at the end of each double row, in 3-in. deep holes. When the resulting seedlings are 3 in. high, plant them out in any gaps that appear in the rows. If there are no gaps, pull them up and throw them on to the compost heap.

### GENERAL CARE

Blackfly (black aphid) is a serious pest of broad beans. It can be discouraged if the top inch of each plant (the succulent part beloved by the blackfly) is pinched out when the first flowers appear. This "stopping" also encourages the production of earlier beans. Spray the plants with

liquid derris, malathion, lindane or nicotine.

Use a Dutch hoe lightly between the rows and among the plants during the spring and summer to loosen the soil to a depth of ½ in. Directly the bean crop has been picked, cut the plants down to within 1 in. of soil level; the tops are valuable on the compost heap as they are rich in potash. Autumn-sown beans, if cut down in this way, will produce secondary stems which may yield another late crop. The roots of the beans should always be left in the ground because nitrogen nodules on them benefit the future crop (see *The Soil*).

### HARVESTING

Pick the pods while the beans inside are still young and tender, but not before they are the size of sixpenny pieces; they are not wholesome when smaller.

### RECOMMENDED VARIETIES

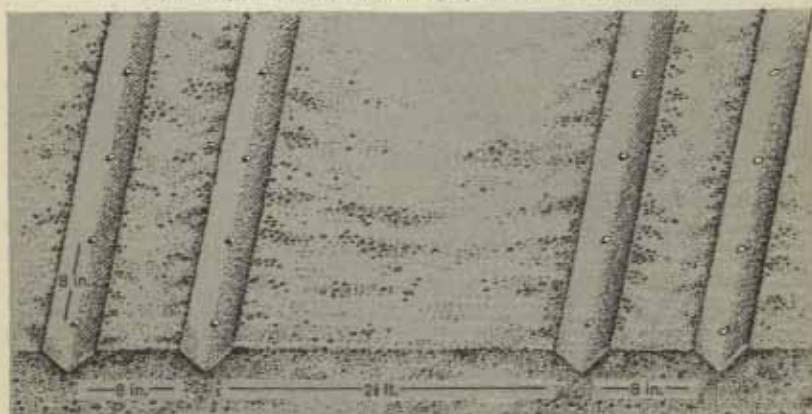
#### *Dwarf Broad Beans*

Sutton, grows only 10 in. high, and branches freely.

Dwarf White Fan, green seeded with small pods. Grows 1 ft. high. Early.

### SOWING BROAD BEANS

Sow the beans 8 in. apart in 3-in. deep, V-shaped drills. Make the drills in pairs 8 in. apart, allowing 2½ ft. between each pair







## PINCHING OUT BROAD BEANS

To discourage blackfly and encourage the production of earlier beans, pinch out the growing tip of each plant when the first flowers appear. Pick the pods when the beans are still young and tender

*Long-pod Beans*

Aquadulce Claudia, the earliest; produces very long pods of good flavour. Recommended for autumn sowing.

Green Long-pod, green-seeded; early and prolific. Long pods; good for cooking. Johnson's Wonderful, medium-sized pods; often used when half-grown and cooked whole.

Masterpiece, superior green-seeded variety with long pods.

Sussex Wonder White Long-pod, very broad pods; most prolific and earlier than Johnson's Wonderful.

*Windsor Beans*

Green Windsor, a heavy cropper of good flavour.

White Windsor, not such a heavy cropper, but has better flavour and cooking qualities.

## DWARF OR FRENCH BEANS

These beans, which are sometimes also called kidney beans, are preferred in

France to the coarser runner beans; in Britain they are neglected when the runners start cropping. Successional sowings will provide french beans through much of the year. There are both green and golden varieties.

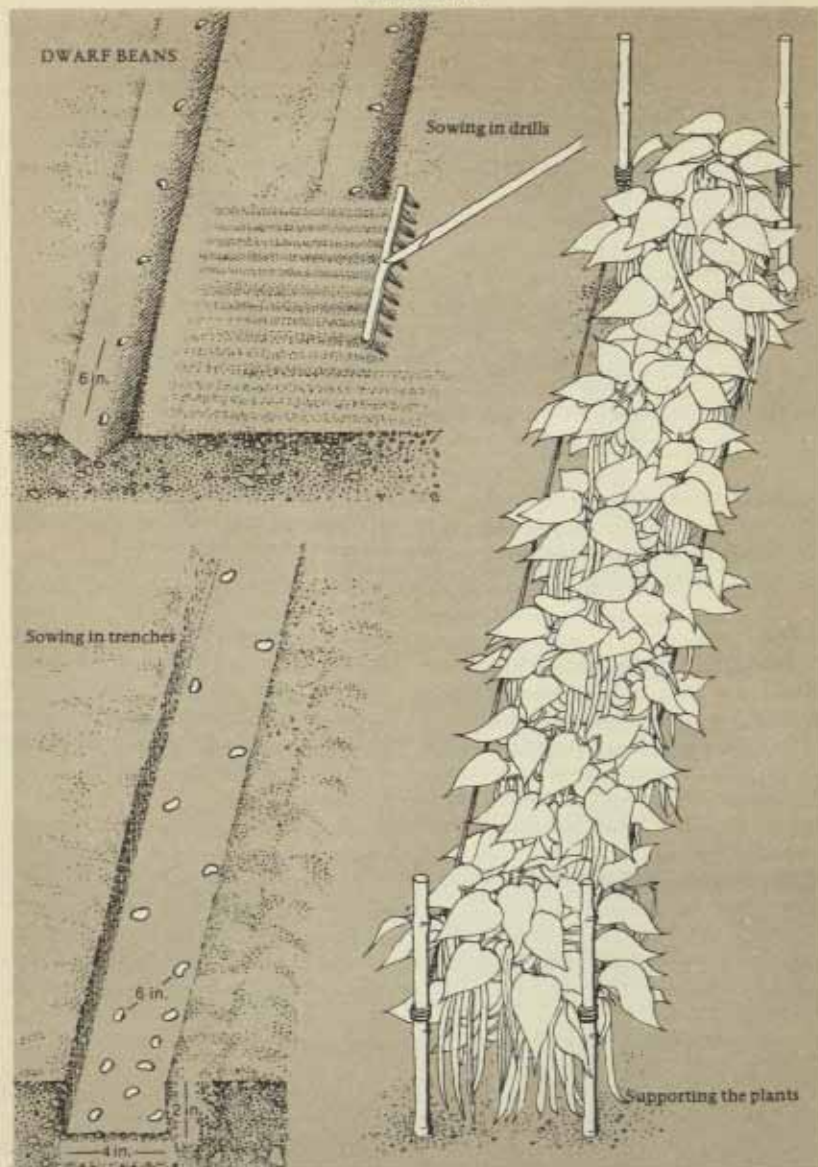
## SOIL PREPARATION

French beans prefer a light soil, but they can be grown in heavy clay if ample fine organic matter is forked in. There is perhaps no crop that withstands dry conditions better; french beans crop on poor soil and leave it in better condition after cropping because nitrogen is built up through bacteria working in small white nodules on the roots.

Dig the ground to a spade's depth in the autumn and bury old compost and well-rotted dung at the rate of a large bucketful to the sq. yd. Leave the ground rough, especially if it is heavy, and frost and cold winds will help to make it friable for a light forking in the spring. At this time add a fish manure with a



# VEGETABLES



Sow the seeds in a straight line along a V-shaped drill, or in a zigzag along a flat-bottomed drill. Always put a few extra seeds at the end of each row to provide seedlings for filling gaps. In a windy situation, support the beans by pushing in a 4-ft. bamboo cane at the end of each row and running a piece of string, tied to the canes, down either side of the row

6 per cent potash content at 3 oz. to the sq. yd. and, unless the soil is chalky, give a surface dressing of carbonate of lime at 5 oz. to the sq. yd.

#### SOWING

French beans should not be sown until the ground is warm; this usually means the last week of April in the south and the second week of May in the colder parts of the north. As damp is this vegetable's greatest enemy, do not sow until the soil is sufficiently dry, and never pour water in the drill at sowing time.

Put down a line stretched taut as a guide, and scratch out a V-shaped drill 2 in. deep with the corner of a draw hoe. Sow the seeds 6 in. apart in this drill and afterwards rake lightly to cover the beans completely. Then firm the soil over the top of the seeds with the rake head, and finally give a light raking to remove foot and rake-head marks.

Another method of sowing is in a double row; use a 4-in. wide draw hoe to rake out a flat bottomed drill 2 in. deep and 4 in. wide. Place the beans zigzag fashion, 6 in. apart along the drill.

In both cases sow eight to ten beans 2 in. deep and 2 in. apart at the end of each row, and when the seedlings are 2 in. high use them to fill up gaps in the main rows.

#### SUCCESSION OF CROPS

For regular picking of beans sow a row every three weeks, from the last week of April until the middle of July. If a different variety is sown each time, the variety with the best cropping powers and flavour for the particular garden can be discovered. In small gardens, sow half rows of french beans every three weeks instead of full rows.

For early french beans sow the seed under cloches or ganwicks in mid-March; the beans can then remain covered until the end of May when they

will be almost ready for picking. As the soil tends to dry out, it is sometimes necessary to water under cloches or ganwicks when the plants are 6 in. high. Early in October, cover the mid-July sowings with cloches or ganwicks to protect them from frost. It will then often be possible to pick the beans until the second week of November.

#### GENERAL CARE

Normally, french beans will stand upright of their own accord, but in windy situations provide bushy twigs, such as pea sticks, to keep the plants upright and the beans from trailing on the ground. Alternatively, plant a 4-ft. bamboo cane at both ends of each row and run a piece of string, tied to the canes, down either side of the row to keep the plants upright. Supporting the plants keeps the beans clean and free from soil and lessens damage by slugs. Hoe lightly between the rows when necessary, tending to draw the soil up to the plants rather than away from them. In a dry season, apply sedge peat as a mulch on either side of the row to a depth of  $\frac{1}{2}$  in. and for a width of 6 in.

#### SLUGS

When there is a serious attack, kill the pests with Slugit pellets sprinkled in between the rows.

#### HARVESTING

Always pick the pods when they are young and tender. Never allow a pod to produce seed for this will discourage the plant from cropping again. Most french beans are stringy unless they are picked young, but there is a delicious and stringless variety named Phoenix Claudia.

Pick the beans an hour before they are needed for cooking.

#### RECOMMENDED VARIETIES

Canadian Wonder, an old variety, strong upright grower, pods about  $6\frac{1}{2}$  in. long. Buy seeds from a reputable firm.

Feltham Prolific, slender, straight pods; use when 4 in. long. Good for sowing early under cloches.

Granda, a white-seeded variety, with medium green pods.

Masterpiece, good cropper of excellent quality, suitable for forcing.

Mont d'Or, a little-used, golden-podded variety; delicious fleshy beans.

Phoenix Claudia, the really stringless variety; pods are light green and 5 in. long. Not a very heavy cropper.

The Prince, a dwarf type of bean, with pods often 9 in. long. Produces prolifically and early.

Tender Green, fleshy, tasty pods 7 in. long; sturdy plants, early and prolific.

There are two or three climbing varieties of french beans which should not be confused with runner beans. They are more suitable for growing in the greenhouse in the late winter or early spring. The best is perhaps Jersey Runner, which has abundant narrow, fleshy pods about 7 in. long.

### FLAGEOLET BEANS

Prepare the ground, sow the seed and grow exactly as for french beans; harvest while the beans in the pods are green.

#### RECOMMENDED VARIETIES

Granda, plants grow 1½ ft. high and crop more heavily than White Leviathan.

White Leviathan, the plants grow about 15 in. high and produce plenty of foliage. Flavour is excellent.

### HARICOT BEANS

The plants are grown in exactly the same way as french beans, but the pods are allowed to stay on the plants after the seeds have ripened. When thrashed, the beans are either white or yellowish-brown. Though popular abroad they are seldom grown in Britain, because the yield is low in proportion to the space taken up by the plants.

### SOWING

Where cloches or ganwicks are available, sow the seed 2 in. deep with the rows 1½ ft. apart early in April. Remove the cloches or ganwicks by the end of May, but put them back again in the first week in September to make certain that the pods ripen properly. In sunny dry years, of course, this is not necessary.

When growing the plants in the open without any glass protection at all, sow the seed in late April.

### HARVESTING

Uproot the plants in late September or early in October and put them complete with pods into a sack. Beat the sack with a stick to thrash out the dry beans, separate the seeds from the dried pods and put the haulms and roots on the compost heap. Store the beans in jars or tins for the winter.

#### RECOMMENDED VARIETIES

Brown Dutch, a coarse-growing, vigorous variety. Usually grows 1½ ft. high. The pods ripen well and are easy to shell. The beans are yellowish-brown.

Merton Haricot, a better strain than White Rice. The beans are a little larger, though the crop is not quite as heavy and is ready a few days earlier.

White Rice, a form of the well-known Comtesse de Chambord variety. The plants grow about 15 in. high, and bear masses of small, white-skinned beans. The pods are small.

### RUNNER BEANS

Runner beans are among the most popular vegetables in Britain, yet until about 80 years ago they were grown only because of the beauty of their flowers. They have a stronger flavour and are somewhat coarser than french beans.

#### SOIL PREPARATION

As runner beans are deep rooting it is advisable to dig the land more than a



spade's depth and to bury well-rotted manure or compost 9 or 10 in. down at the rate of a large bucketful to every sq. yd. Alternatively, dig a trench a spade's width across and 2 ft. deep and bury old dung or compost at the rate of two bucketfuls to the yard before putting back the soil and treading firmly.

In either case lightly rake in a fish manure with a 10 per cent potash content at 4 oz. to the sq. yd. Unless the soil is known to be chalky, apply carbonate of lime as a surface dressing at 4 oz. to the sq. yd. At sowing time rake in 2 oz. superphosphate and 1 oz. sulphate of potash to the sq. yd.

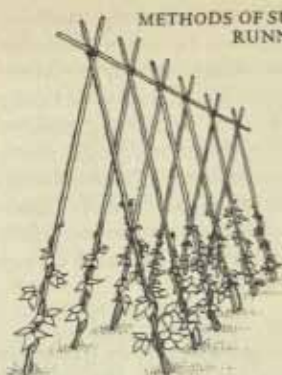
#### SOWING

Because runner beans will not germinate in cold soil, do not sow before the third week in May in the north and the second week in May in the south. In Devon and Cornwall, however, it is often possible to sow late in April. In other areas cloches put in position over the strip of land about the middle of February will help to make the soil warm enough for sowing by the middle of March. To ensure a late picking of runner beans, make a second sowing about mid June (in years when there is no early October frost, beans are sometimes picked in the south as late as early November).

Runner beans can be grown in two main ways: (a) to climb up wire netting or poles, when the sets of double rows should be 5 ft. apart and (b) on the flat, like french beans, using a dwarf-growing kind such as Hammond's Dwarf Scarlet, when the rows should be 3 ft. apart.

If the beans are to climb, push poles into the ground 9 in. apart in two rows so that they cross 6 in. from the top. Lash them together where they cross. In exposed situations, tie bamboos along the V formed at the top of these poles to provide extra support. Sow the seeds at the base of the poles and 9 in. apart, so

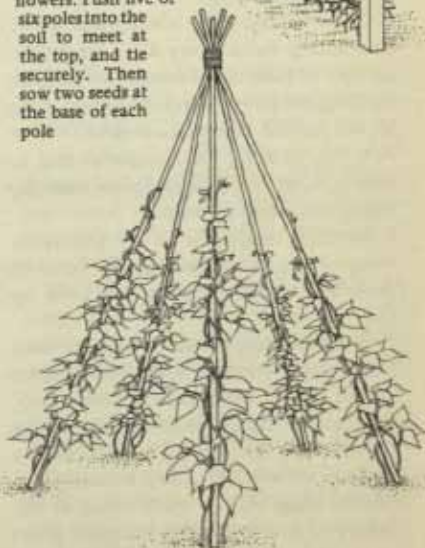
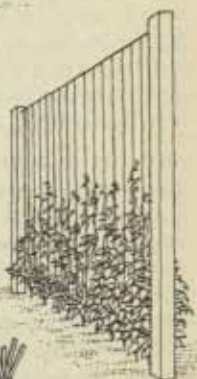
#### METHODS OF SUPPORTING RUNNER BEANS



*Above:* The beans are planted 9 in. apart, to grow up poles lashed together at the top to make a firm structure.

*Right:* The beans climb strings 4½ in. apart and held in place by wires along the row.

*Below:* Runner beans can be grown for their display of flowers. Push five or six poles into the soil to meet at the top, and tie securely. Then sow two seeds at the base of each pole.



that the plants can climb up naturally.

Sow the seeds at a depth of 2 in. either by taking out drills to this depth with the point of a draw hoe held against a tightly stretched line, or by making separate holes with the dibber at the right depth and dropping one seed into the bottom of each. Put in a dozen beans in a circle at the end of each row, and a month later use the plants that result to fill up any gaps in the main row.

#### EARLY CROPS

Use a cool greenhouse or frame for raising early beans. Sow the seeds in Eclipse No-Soil or John Innes compost 2 in. apart, in a box at least 4½ in. deep. Fifty plants can be raised in a box 2 ft. by 1 ft. Plant out early in June.

#### METHODS OF GROWING

Runner beans may be grown on the same strip of land year after year. A good situation is, therefore, by the fence at the bottom of the garden, where they will please the eye and will not interfere with or shade other crops.

Alternatively, drive strong 8-ft. posts into the ground every 8 ft. across the garden or plot, and stretch two lengths of telephone wire between them, one at the top of the poles and the other near the bottom. Tie upright strings to the wires at 4½-in. intervals so that the beans can climb up them.

Another method is to use 2-in. mesh wire netting stretched tightly between posts and to allow the beans to grow up the wire.

A particularly attractive runner-bean flower with crimson and white blooms comes from a variety called Painted Lady. To make a display, push a group of five or six poles into the flower border to meet at the top like a Red Indian tepee. Secure them tightly with string at the apex and sow two seeds in dibber holes at the base of each pole. Before long

the whole structure will be covered with leaves and flowers.

Whatever the method used, be sure that the structures are really firm, because loose, wobbly supports can seriously affect the plants.

Another idea is to grow the climbing varieties as though they were dwarf kinds. Sow the rows 3 ft. apart with the beans 8 in. apart in the rows, and when the plants are 1 ft. high cut them with a pair of shears so as to keep them dwarf. Clip them back again a fortnight later, and then at fortnightly intervals. The plants are kept small in this way, but because the beans tend to lie on the ground they get dirty.

#### GENERAL CARE

As the roots of runner beans need plenty of moisture if they are to crop heavily, apply a mulch of lawn mowings or sedge peat along the rows in late June, spreading it 1 ft. on either side of the plants. Lawn mowings should not be put on deeper than ½ in. because a greater thickness is apt to heat up and damage the stems of the beans.

During dry weather in the summer, spray water on the plants from time to time, preferably in the late evening; this will help the set of the flowers. Be prepared to water well with an overhead sprinkler for at least an hour once a week during a drought.

#### SLUGS

Slugs can be a great nuisance in attacking this crop when the plants are first coming up. Apply Slugit pellets along the rows; the slugs will leave the plants and feed on the pellets, which will kill them.

#### HARVESTING

It is most important to pick all the beans as they become ready—before the seeds start to swell inside—or cropping will stop because the plant has succeeded in reproducing itself.

Look for the pods hidden behind the bigger leaves towards the base of the plant. The more the beans are picked, the greater the yield.

#### RECOMMENDED VARIETIES

Czar, a white-seeded variety, which does better than any other kind in dry years. The pods are broad and tasty and can be left on the plants for the beans to be thrashed out for winter use as dried butter beans.

Cookham Dean Improved, good strain, bearing a heavy crop of long slender beans of fine quality.

Giraffe, a typical, tall-growing variety producing fine pods of exceptional length and quality.

Hammond's Dwarf Scarlet, a new

runner bean that never climbs. It remains 2 ft. high.

Kelvedon Marvel, an early, prolific, semi-dwarf type which is useful to grow by the cutting-back method.

Painted Lady, the beautiful crimson-and-white-flowered kind. A moderately heavy cropper, with prettily marked seeds.

Princes, very similar to Kelvedon Wonder but slightly smaller. The easiest scarlet runner to grow.

Prizewinner, often grown for exhibition because it produces immensely long fleshy pods of good flavour.

Streamline, one of the most widely grown varieties. It produces long pods of excellent quality, usually borne in clusters of five or six.

## BEETROOTS

Two types of beetroot are normally grown, the round or globe and the long.

#### SOIL PREPARATION

Beetroots do best on a light, sandy loam but will grow perfectly well on heavier soils that are suitably prepared.

Fork into the ground old compost or sedge peat at one bucketful to the yard. On a clay soil dig the plot over in the autumn and leave it rough. The frost and cold winds will break down the clods and make it easier to rake the soil fine in the spring.

Before seed sowing, apply meat or bone meal or a fish manure with a 6 per cent potash content at 4 oz. to the sq. yd. and rake in lightly.

#### SOWING

The seeds sold in packets are really little fruits containing three or four seeds. It is therefore unnecessary to sow such seeds in a continuous row. Sow two fruit

capsules every 4 in. along a 1-in. deep, V-shaped drill which has been prepared with a draw hoe. (This is called station sowing.)

For the round or globe beet sow the seed in rows 1 ft. apart; the long varieties should be 1½ ft. apart. After sowing, cover the seed by filling in the drill with the back of the rake head and then firm over the line with the rake held perpendicularly to the soil. Lastly, rake lightly to remove marks.

Make the first sowing of early globe beet about the middle of April and the second sowing about the middle of May. A third sowing about the second week in July will provide tender young roots in the autumn and early winter.

The long beet, the roots of which are allowed to reach full maturity before being harvested in the winter, is usually the main beet crop and is sown about the middle of June.



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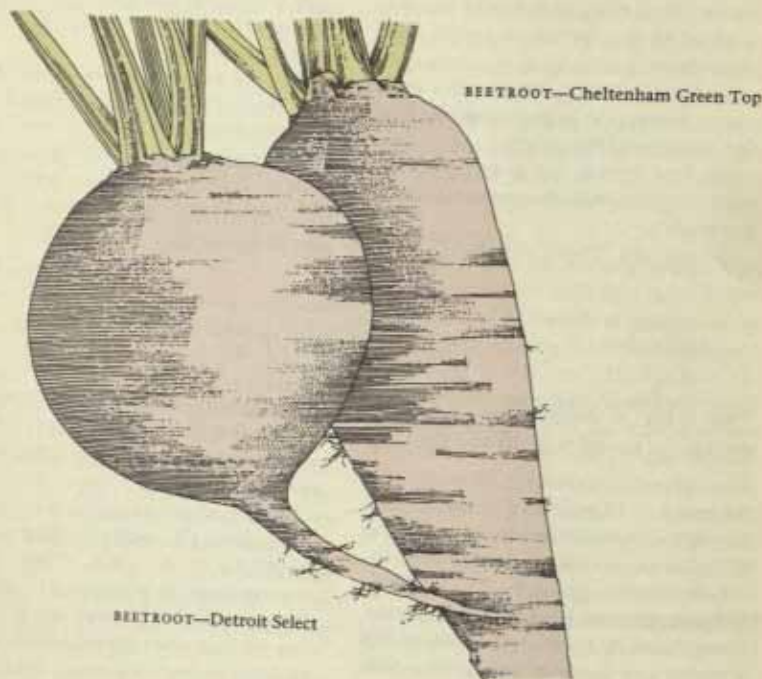
The long beet, the roots of which are allowed to reach full maturity before being harvested in the winter, is usually the main beet crop and is sown about the middle of June.

## VEGETABLES

### GENERAL CARE

Use the sharp blade of a Dutch hoe to keep the weeds down between the rows, but be careful never to cut the roots of the beets or they will bleed and their colour will be lost. Thin out the seedlings to one per station when they are  $1\frac{1}{2}$  in. high, and when the roots are the size of golf balls pull out every other one, thus

keep.) Alternatively put the roots in a heap about 3 ft. high and about 3 ft. across. Cover with straw 6 in. deep and over the straw put a layer of soil 6 in. deep, and pack down with the back of a spade. When getting out the soil for this purpose, make a trench round the mound of beet to help drainage. Such a heap is called a clamp, bury or hale.



leaving the remaining roots 8 in. apart.

The roots pulled out when thinning can be used as a vegetable.

### HARVESTING

Pull the early sown crops as soon as they are large enough and are required. The later roots may be lifted with a fork in November, for storing in boxes of sand or peat in a frost-proof shed. (Twist off the tops near the crown, but not too near or bleeding will result and the roots will not

### RECOMMENDED VARIETIES

Bell's Non-Bleeding, a deep, blood-red tapering root of medium size which seldom bleeds when bruised.

Cheltenham Green Top, perhaps the best of the long-rooted beetroots. It stores and cooks well, and the flesh is bright red.

Early Wonder, another of the flattened globe type like Egyptian Turnip-Rooted. The roots are uniform in size



and the foliage is a greeny-red colour. Admirable on shallow soils.

Egyptian Turnip-Rooted, a very early, flat-topped globe beetroot of good, deep colour. An excellent variety for sowing under cloches or ganwicks.

Detroit Select, a uniform, globular root of excellent quality. The flesh is deep red and free from white rings or zones.

Nutting's Select Red, the long roots are somewhat thicker than Cheltenham Green Top and are a good deep colour. The foliage is red with a green tinge.

Obelisk, an excellent-flavoured oval, half-long beet.

Ruby Queen, smooth-skinned and uniform roots. The flesh is dark red and free from white zones.

## SEAKALE BEET

This is a dual-purpose vegetable. It produces thick, ivory-white stems, often 8 in. long, with large dark green leaves above. The white part, or midrib, is served as seakale and the dark green foliage as spinach. It is also known as silver beet and as Swiss chard.

### SOIL PREPARATION

Seakale beet grows well on almost any soil, but gives the longest stems and largest leaves on land that has been manured with well-rotted compost and old dung at the rate of a bucketful to the sq. yd. When the tilth is being prepared rake in fish manure with a 6 per cent potash content, or a complete fertilizer, at the rate of 4 oz. to the sq. yd. When the plants are in full growth, water every ten days with diluted Bio Humus, or some other liquid fertilizer.

### SOWING

Make two sowings, the first one early in May and the second about the third week in June. Sow the seed in rows 15 in. apart, and as soon as the plants are large enough to handle thin them out to 4 in. apart. Thin out again about two weeks later to 8 in. apart.

Alternatively, take out drills 1 in. deep and 15 in. apart. Sow three seeds at stations 9 in. apart along the drills. If the three seeds germinate, thin the seedlings to one per station.

### GENERAL CARE

Hoe the rows to keep down the weeds and, if the weather is dry, water the rows regularly, since seakale grows rapidly in warm weather.

### HARVESTING

Do not cut off the dark green leaves leaving the white stems on the plants or the stems will rot back and cause trouble. Pull off the stem and leaves in one piece. Keep pulling regularly as the leaves become ready, throughout the summer and well into the early winter. Some plants live through the winter and may be pulled again in the spring.

### RECOMMENDED VARIETIES

New Giant Seakale, produces very large leaves with ivory-white prominent ribs.

Silver Kale, has large dark green leaves. Plants are bushy, and the white stems are shorter than New Giant Seakale.

# BROCCOLI

There are two main types of broccoli: curding and sprouting. The curding types produce white heads like cauliflowers; the sprouting types produce numerous side shoots with tiny heads, which are either purple or white, depending on the variety.

## CURDING BROCCOLI

This is sometimes known as winter cauliflower. The curds are generally a little coarser than the true summer cauliflower. Many seedsmen's catalogues list winter cauliflowers in the following groups: Autumn, Winter, Spring, Late Spring, and Early Summer.

Broccoli produces curds from the end of September until the middle of the following June. It is possible to have curds all the year round if the true cauliflower is grown as well.

## SOIL PREPARATION

Broccoli will grow in almost any soil, provided that it has been well manured. The plants do best on really firm ground and, because they are planted out in the summer, it is best for them to follow a well-manured crop such as potatoes, broad beans or early peas.

If the site was well manured for the previous crop, it need be forked only very lightly, to clean up after the harvesting. After forking, tread the soil down and add fish manure with a 10 per cent potash content at 3 oz. to the sq. yd. Then give a light raking and leave the ground level.

If the soil is not limy or chalky, give it a surface dressing with carbonate of lime at 4 to 5 oz. to the sq. yd. just before planting out; if this top dressing is given, do not give nitrogen late in the season, otherwise soft growth will be encouraged

and the plants will not be hardy. A useful dressing is 5 parts by weight of hoof and horn meal, 4 parts superphosphate and 2 parts sulphate of potash, used at the rate of 4 oz. to the sq. yd.

## SOWING

Sow the seed of autumn varieties about mid-April in the north and at the end of April in the south. Sow winter varieties later, the seed of spring varieties a week after that, and seed of the really late kinds about the middle of May. Thus, succession with broccoli is assured by variety and not by successional sowings.

The seed bed need be no wider than 3 ft. To encourage a good root system, enrich the seed bed with really fine compost or sedge peat at the rate of a bucketful to the sq. yd., raking it into the top inch or two only. Take out drills 6 in. apart and  $\frac{1}{2}$  in. deep, and sow the seed thinly in these shallow drills. Rake the soil over lightly to cover the seeds and firm with the rake head.

## PLANTING

Try to plant out as soon as the ground becomes available and before the plants in the seed bed get too long and lanky. Though in Devon and Cornwall broccoli may be planted out as early as June, the month for main-crop planting out in other districts is July. The later kinds need to be planted out before this because they need a longer season of growth. Make the rows 2½ ft. apart and allow 2 ft. between the plants in the rows. Be sure to put a few plants in the seed border as a reserve for filling in gaps a fortnight later, if necessary.

Put the plants in, very firmly, up to their lower leaves. If the weather is dry at planting time, pour water into the holes to give the plants a good start.

## GENERAL CARE

Towards the end of August or early in September, use a draw hoe to take out a furrow between the rows of plants. The broccoli will thus be earthed up slightly and the furrow will help to prevent the roots from being waterlogged.

Heeling-over is carried out in October or early November. This consists of removing the soil to a depth of 9 in. on the north side of each broccoli plant and pushing it over carefully with its head towards the north. Growing the plants at an angle protects them from the damage that can be done by early morning sun following a frost. During a hard winter, a feed of nitrate of potash at 1 oz. to the sq. yd. may be given in February.

## HARVESTING

Cut the white curds as soon as they are ready and before they start to open up. If a number of broccoli plants are ready together, delay cutting some of them by breaking two or three of the larger leaves over the curds for protection.

Alternatively, pull up some plants that are ready to use and hang them upside down, in a frost-proof shed; they should keep successfully.

## RECOMMENDED VARIETIES

*Autumn*

Roscoff Extra Early, suitable for the south and south-west. White curds. September to December.

Veitch's Self-Protecting, produces large, close, pure white curds. October to November.

*Winter*

Early Feltham, very hardy, large, snow-white heads. January to February.

Roscoff Noel, suitable for sheltered garden. December to January.

Snow's Winter White, large creamy-white head of uniform size. February to March.

*Spring*

Cambridge Hardy, late. Good hardy variety for the north. April to May.

Late Feltham, pure white heads of uniform size. April to May.

Leamington, good-quality white curds. April.

Lenten Monarch, large white heads. April.

*Early Summer*

Midsummer, very good variety for cutting late. May to June.

Rear Guard, high quality white heads. June to July.

## SPROUTING BROCCOLI

This is a very popular vegetable for the winter as the plants are hardy and the small unopened flower heads on short stems have a good flavour.

## SOIL PREPARATION

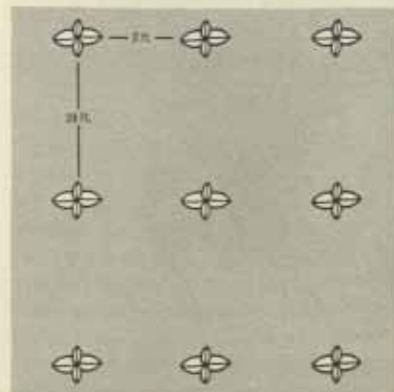
As for curding broccoli.

## SOWING

Sow in April or early May in a seed bed similar to that for curding broccoli.

## PLANTING

Give the plants plenty of room for development, putting out the early varieties 2 ft. by 2 ft. and the late kinds  $2\frac{1}{2}$  ft. by



Planting distances for broccoli



2½ ft. Plant really firmly, putting plenty of water into the holes at planting time if the weather is dry.

#### GENERAL CARE

Keep the soil lightly hoed in the summer, but do not heel the plants over as for curding broccoli.

#### HARVESTING

The flowering shoots grow out from the axils. When the shoots are about 1 ft. long, cut them to within 2 in. of their base; as a result more shoots will be produced later.

Do not remove the main leaves until they turn yellow, because they give protection to the delicate shoots. Later on in the season the main leaves themselves may be eaten as a vegetable.

#### RECOMMENDED VARIETIES

Calabrese, sometimes known as Green

Sprouting broccoli, because the side shoots are green and often much larger than those of the normal sprouting broccoli; not, however, a winter vegetable but is available in late summer and early autumn.

Early Purple Sprouting, has small shoots with purple heads in March.

Early White Sprouting, for use in February and March. Small white heads on short shoots.

Late Purple Sprouting, similar to the Early Purple Sprouting, but is far hardier and more prolific. April to May.

Late White Sprouting, has longer shoots and is hardier than Early White Sprouting. March to April.

Nine Star Perennial, each plant produces 15 or so small creamy-white heads each year for five years. Sow seeds in May; plant out 3 ft. square in early September.



BROCCOLI—Veitch's Self-Protecting



## BRUSSELS SPROUTS

The sprouts on the left are of good quality: each "button" is tight and firm and is well placed on the stem. Those on the right are badly grown, loose and broken

## BRUSSELS SPROUTS

One of the most popular green vegetables in Britain, Brussels sprouts can be grown satisfactorily only in firm soil, where they can be given deep manuring and have plenty of room to develop.

## SOIL PREPARATION

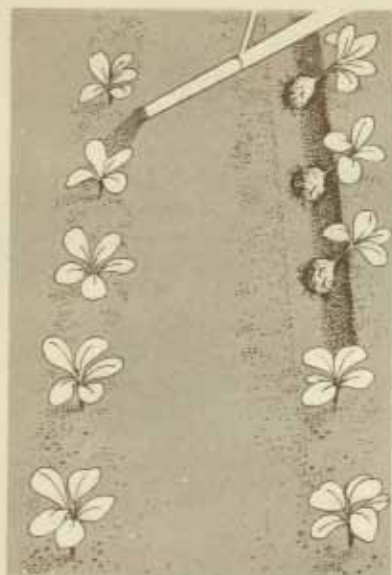
Dig the ground deeply in the autumn, burying (at a spade's depth at least) well-rotted dung and old compost at the rate of one and a half bucketfuls to the sq. yd. Leave the soil rough for the frost and cold winds to act upon, and in the spring fork it over an inch or two deep, adding either fish manure at 4 oz. to the sq. yd. or a complete fertilizer at 4 to 6 oz. to the sq. yd. Alternatively, use a mixture of two parts hoof and horn, one part sulphate of potash, four parts bone meal, at

the rate of 4 oz. to the sq. yd. Follow this by a good treading to make the soil firm, then by a light raking to leave the surface level and the particles of soil fine.

Because the sprouts themselves need not be planted out until late May or early June, it is possible to sow lettuce in rows 1 ft. apart on the same site in March. It does not matter if all the lettuces have not been harvested before the sprouts are planted: the sprouts will benefit from the ground being trodden on while the lettuces are being cut.

## SOWING

Sow the seeds in a sheltered seed bed in drills no deeper than  $\frac{1}{4}$  in., and 6 in. apart. To raise very early sprouts, sow the seed about the middle of September



**PLANTING BRUSSELS SPROUTS**  
Plant out 4- to 6-in. high plants 3 ft. sq.,  
firm the soil and then water well

in a sheltered corner, to allow the plants to develop throughout the winter. Winter sowings have been successful as far north as Lancashire and Cheshire. To produce early sprouts in very exposed situations, sow the seed in frames in January. For normal harvesting sow in February or early March.

#### PLANTING

Start successional planting out about the third week in May and continue until the second week in June. Choose the largest plants (4 to 6 in. high) in the seed bed, and plant out 3 ft. square. If planted during a showery period, the sprouts will settle down quickly and well. Not only should the ground be firm but the plants should be well firmed in. If the weather is dry, water the plants in well. Do not plant weaklings or plants that have no growing point in the centre.

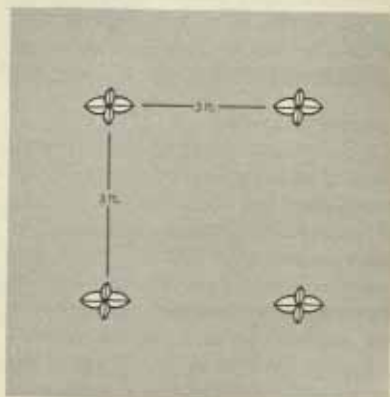
#### INTERCROPPING

As the rows are 3 ft. apart another crop can be interplanted. French beans are suitable, and the seed may be sown under cloches, midway between the rows of Brussels sprouts (or where the rows are to be) about mid-March. When the Brussels sprouts need the room, cut down the french bean plants to a low level with a pair of shears, leaving the roots in the ground to provide extra nitrogen for the sprouts. Use the haulms as a mulch for the Brussels sprout plants.

#### HARVESTING

Do not remove the big leaves of the sprouts until they are decaying and turning yellow. The heads of the plants should not be removed until the end of February, for they protect the sprouts forming below and manufacture elaborated sap which will feed them.

It is better to cut sprouts off than to break them off. At the beginning of the season start picking from the bottom of the plants and work up gradually as the sprouts themselves mature. The crop usually starts in October and is at its best in November and December. It can continue until the end of March. When the



Planting distances for Brussels sprouts



sprouts are cut off, a secondary crop is produced at the base of the sprout stems and these rather open sprouts are quite useful in years when green vegetables are scarce or if the garden is small.

#### RECOMMENDED VARIETIES

Be sure to buy seeds from a seedsman who specializes in Brussels sprouts, for the strain is as important as the variety. As some varieties do better than others in some localities, take his advice.

Cambridge No. 1, an early type which produces large, firm sprouts of excellent quality. Particularly suitable for autumn sowing.

Cambridge No. 3, a main-crop variety, producing large sprouts.

Cambridge No. 5, a very late variety. Heavy-cropping, large sprouts.

Cambridge Special, a favourite small-button sprout, compact and excellent for deep freezing.

Darlington, an early dwarf variety for small gardens. Good on sandy soil. Bears firm, medium-sized sprouts.

Irish Glacier, small, dark green buttons which are easy to pick. A good sprout for quick-freezing.

Perfection, a good northern variety: plants 2½ ft. high with dark green foliage. Can be picked early in October. Excellent for freezing.

Rous Lench, a favourite in the west country. Produces prolific and excellent dark green solid sprouts.

Sanda, a medium type with small dark green sprouts, well spaced for easy picking. Excellent for freezing.

## CABBAGES

Several different types of cabbage are indigenous to Great Britain—the round-headed and flat-headed varieties for spring and summer sowing, the pointed varieties for spring sowing only, the special pointed varieties for autumn and spring sowing, very large drum-head varieties (somewhat coarse for home use) and the red kinds for spring sowing.

#### SOIL PREPARATION

Cabbages will grow in all kinds of soil, though the varieties that are ready for use in the spring naturally prefer a lighter soil which warms up quickly after the turn of the year and encourages the roots to grow earlier.

Where cabbages are to be planted out after a well-manured crop, as usually happens in the case of the spring cabbages, no special preparation or manuring is necessary. But when cabbage is the main crop, as in the case of the summer,

autumn and winter kinds, dig the soil over and add well-rotted compost or old dung at the rate of a bucketful to the sq. yd.

When the soil is raked level for planting out, use a balanced fish manure at the rate of 3 oz. to the sq. yd. Make certain that the soil is not acid; apply carbonate of lime at 5 oz. to the sq. yd., unless the soil is chalky.

#### SPRING CABBAGES

These are cabbages that are ready for use in the spring: they are not spring-sown cabbages. As they have to grow steadily throughout the winter, choose for them, if possible, a sheltered spot on really well-drained land. They prefer light soil which will warm up quickly after the turn of the year, and so will encourage the roots to get growing early. If these cabbages are planted immediately after the harvesting

of a well-manured crop such as potatoes or peas, no special soil preparation or manuring is required. It is not even necessary or advisable to rake the soil level before planting out seedlings, because the clods of earth will give protection to the plants against cold surface winds.

#### SOWING

Choose a semi-shady seed bed and rake in fine sedge peat at the rate of a bucketful to the sq. yd. Firm the ground by treading, rake once more, and then, with the corner of the draw hoe, scratch out drills  $\frac{1}{2}$  in. deep and 6 in. apart. Sow the seed thinly in the drills, and rake to cover up. Firm over the top with the rake head. Sow seed about the middle of July in the north of the British Isles, and late in July or early August in the south.

#### PLANTING OUT

If seed was sown at the right time, the plants should be ready for planting out about the middle of September in the north and late in September in the south. Water the seed bed well the day before planting out. Lift out the plants with a hand-fork so that the roots remain

covered with a little soil, and lay the plants in the seed bed, keeping their roots covered with damp sacking until they can be planted. With a dibber make rows of holes in the planting-out area  $1\frac{1}{2}$  ft. apart, leaving 1 ft. between the holes in each row. Plant the seedlings firmly and, if the soil is very dry, or there is no rain, pour a cupful of water into the dibber hole at planting time. Put the plants 6 in. apart in the rows, and then in February cut every other cabbage for use as greens.

#### GENERAL CARE

Until the end of October, hoe between the rows to keep down weeds. In early November, if the soil is heavy, make a 4-in. furrow between the rows to carry away excess moisture. In early spring, and only after growth has started naturally, give a top dressing of nitrate of soda, sulphate of ammonia or dried blood at the rate of  $\frac{1}{4}$  oz. per plant. If, however, the plants have been set at 6 in. apart do not top dress until alternate plants have been cut, and then apply the dressing at 3 oz. to the sq. yd. Spring cabbage must be encouraged to heart early in the spring.

#### RECOMMENDED VARIETIES

Early Durham, medium-sized, pointed hearts. Very early. No outer leaves.

Early Offenham Selected, pointed head, uniform in shape and dark in colour. Notably free from outer leaves. Early.

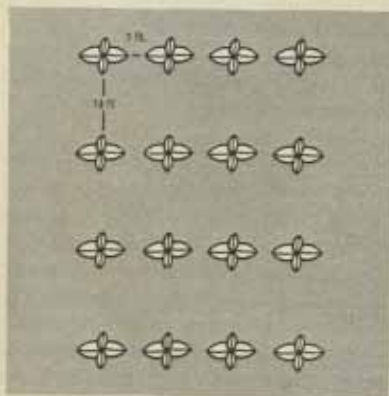
First Early Market 218, solid, well-pointed, firm hearts. Very early.

Harbinger, small, pointed dark green heads. Very early.

Wheeler's Imperial, solid hearts, dwarf.

#### SUMMER AND AUTUMN CABBAGES

The seed bed may be in any odd spot, but to ensure good roots, fork in fine compost or sedge peat at a bucketful to the sq. yd. before sowing. Afterwards apply

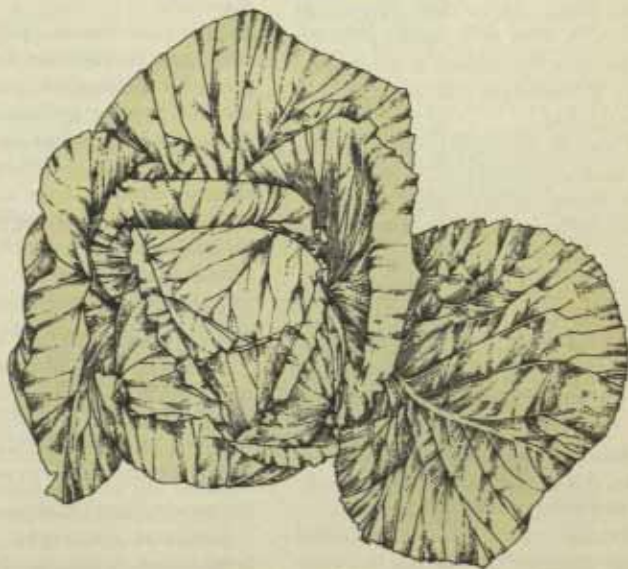


Planting distances for spring cabbages

VEGETABLES



CABBAGE—Christmas Drumhead



CABBAGE—January King



## VEGETABLES

carbonate of lime at 4 oz. to the sq. yd. unless the ground is already chalky. A complete fertilizer can be used and forked in at the rate of 4 oz. to the sq. yd.

### SOWING

Sow the seed about the middle of March, and to ensure succession, make a second sowing a fortnight later.

### PLANTING

The plants will not be ready for putting out in their final positions until the third week in May or early June. Make the rows 2 ft. apart and allow 1½ ft. between the plants.

### EARLY PLANTS

To have very early well-hearted cabbages in June, sow the seed of a variety such as *Primo* early in February in a cold frame in rows 6 in. apart. When the plants come through, some ventilation will be necessary on warm days. Increase ventilation of the frame in March, and early in April take the lights off altogether for a day or two and then lift the plants carefully, putting them out in their permanent positions in rows 1½ ft. apart, allowing 1 ft. between the plants. Cabbages are usually planted with a dibber.

### GENERAL CARE

Use a Dutch hoe lightly between the rows, no deeper than ½ in., to keep down weeds. Watch out for greenfly, whitefly and caterpillars and, if any of these pests appear, spray the plants thoroughly with liquid derris or a proprietary insecticide.

### HARVESTING

Cut the cabbages as soon as they have good hearts. Pull up the stumps, put them on the compost heap and sprinkle them with fish manure.

### RECOMMENDED VARIETIES

Greyhound, the earliest-hearting cabbage. Conical-headed, spring-sown.

*Primo*, a very early round-headed cabbage, excellent for sowing in frames in February.

Velocity, early, round, flattened; with medium-sized heads on short stems.

Winnigstadt, a grey-green compact cabbage, with solid, pointed heads.

## WINTER CABBAGES

### SOWING

Sow the seed as for summer and autumn cabbages. In parts of the north, it is necessary to sow the seed in the middle of March because of the shorter season, but in districts where the weather is mild it can be sown in April or early May.

To save time and labour, an alternative way is to sow the seed where the cabbages are to grow; this avoids the check to the plants which normally results from planting out, especially during a hot, dry period. Sow three seeds every 2 ft. along a drill and thin out the plants later to one per station. So as not to waste room, sow radish seed between the rows of cabbage seed as a catch crop.

### PLANTING

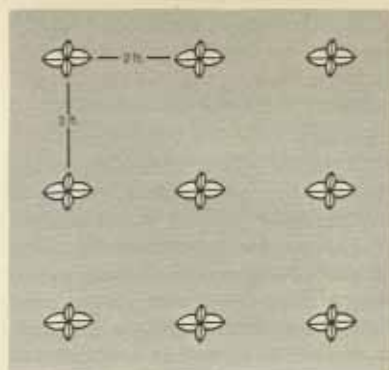
In July, plant the seedlings out firmly, allowing 2 ft. between the plants. It is invariably necessary to pour water into the holes at planting time, or to put overhead irrigation apparatus in position after planting to give the plants a good soaking. Watch out for attacks of black flea beetles after planting; combat them by dusting liberally with fine derris, lindane or D.D.T.

### HARVESTING

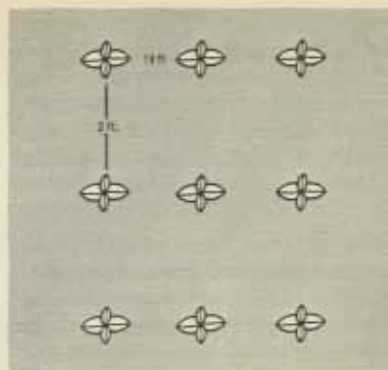
Winter cabbage will be ready for cutting any time between November and the end of February depending on the variety sown. Once the cold weather starts it will be a long time before the hearting cabbages burst and go to seed.

### RECOMMENDED VARIETIES

Christmas Drumhead, usually used long before Christmas. Produces solid hearts. Almost flat.



Planting distances for winter cabbages



Planting distances for red cabbages

January King, probably the hardest cabbage grown, has savoy-like leaves with a bluish tint. Remarkably frost resistant. December to January.

### RED CABBAGES

#### SOWING

Sow the seed in the same way as for summer cabbage.

For particularly large red pickling cabbages, sow in a seed bed in the middle of August and plant out the following April. For red cooking cabbages, sow the seeds in April and put out the plants at the end of May.

#### PLANTING

Plant out the seedlings when they are 3 or 4 in. high, in rows 2 ft. apart, allowing 1½ ft. between the plants. Plant firmly, getting the stems well down with the base of the leaves touching the surface of the soil.

#### GENERAL CARE

Until the winter makes it unnecessary, hoe lightly among the plants.

#### HARVESTING

It improves the flavour of red cabbages if they get a touch of frost, so do not pickle them until December or January. Red cabbages may be cut for cooking as soon as they are large enough.

#### RECOMMENDED VARIETIES

Blood Red similar to Dwarf Dutch.

Dwarf Dutch, an early compact variety. Solid hearts of good colour.

The Lydiate, one of the largest; produces very firm hearts. Hardy and suitable for the north.

Niggerhead, one of the best pickling kinds, produces a small compact head. An erect grower, easy to hoe between.

Ruby Red, one of the earlier varieties. Must be sown in the spring and not in August. Suits the northern midlands.

Stockley's Giant Red, perhaps the deepest red cabbage grown. Few outside leaves. Solid, round hearts.

### COLEWORTS or COLLARDS

These are a type of small, extremely hardy cabbage, which can be cut as "greens" or left to form hearts. The variety Hardy Green forms solid, medium-sized hearts and matures comparatively quickly.

#### SOWING

Sow the seeds at any time from the middle of March to the middle of August. If a seed bed is used, plant out a month later, 1 ft. apart each way. If the seeds are sown where the plants are to grow, sprinkle them in rows 1 ft. apart in July, and when

the plants are 1 in. high, thin them out to 6-in. intervals and a fortnight later to 1 ft. apart. Small hearting cabbages will then be ready in the autumn and early winter, and will prove most useful before the spring cabbages are available.

### SAVOY CABBAGES

Savoy is a very hardy member of the cabbage family. Their flavour is improved by a touch of frost so they are regarded as winter cabbages. They do well in the north of England.

#### SOIL PREPARATION

Savoy will grow on poor soils but they do best on heavy loams. It is usual to plant them after early potatoes or peas, when it is not necessary to give any manure.

Fork or rake the soil well and add a fish manure at 3 oz. to the sq. yd. Apply lime as a top dressing at 6 or 7 oz. to the sq. yd. unless the soil is already chalky. In early August a tonic may be given to the plants in the form of a top dressing of nitrate of soda or dried blood at 1 oz. to the yard run.

#### SOWING

In March prepare a seed bed 2 ft. wide in a sunny, warm position. Tread the bed firm and then rake it to make the soil fine, adding fine sedge peat at the rate of a bucketful to the sq. yd. With the corner of a draw hoe take out drills  $\frac{1}{2}$  in. deep and 8 in. apart and sow the seed thinly in these drills. Make the first sowing about the third week of March, the second sowing in the second week of April and the third sowing during the fourth week

of April. For a good succession of savoy through the winter, start with the earlier-maturing varieties and end with the late varieties.

#### PLANTING

Plant out the earlier kinds at the end of June and the later kinds at the end of July. Make the rows 2 ft. apart and allow 2 ft. between the plants. If dwarf varieties are grown, they may be planted as close as  $1\frac{1}{2}$  ft. with 15 in. between the rows. Plant with a dibber, making a good hole so that the plants will be really firm. If the weather is dry, it is important to put water in the hole at planting-out time.

#### GENERAL CARE

Hoe regularly to keep down weeds.

#### HARVESTING

Cut the savoy for use when they are fully hearted. Do not cut until the hearts are quite firm otherwise the flavour is inferior.

Do not allow the stalks to remain in the ground after cutting because they will rob the soil of plant foods.

#### RECOMMENDED VARIETIES

##### *Dwarf*

Early Dwarf Ulm, dark green foliage with solid round hearts. September to October.

##### *Large*

Ormskirk Early, heavy cropping. Large hearts. September to October.

Ormskirk Extra Late, dark green. Good hearts. March to April.

Ormskirk Late Green, very hardy. Large hearts. January to February.

Ormskirk Medium, large hearts with good flavour. November to December.



## CARDOONS

The cardoon is an aristocrat of the vegetable garden. It is a relation of the globe artichoke and was introduced into Britain late in the 16th century. To blanch the stems it is grown in trenches like celery.

## SOIL PREPARATION

Cardoons can be grown successfully in almost any soil, provided that well-rotted manure or organic matter is raked into the bottom of the trench at the rate of one large bucketful to the yard run when it is prepared in the spring. At the same time apply fish manure at 3 oz. to the sq. yd., or sprinkle a complete fertilizer on the bottom of the trench at the rate of 2 oz. to the yard run.

The trenches into which the plants will go should be prepared at the time the seed is sown. They should be 8 in. wide and 1 ft. deep and run north and south if possible. Fork the manure into the bottom of the trench, put back 1 in. of soil and tread down well.

## SOWING

As cardoons need a long season of growth the seed should be sown late in March in a greenhouse kept at a temperature of 55° F. (13° C.). Use John Innes seed compost or Eclipse No-Soil compost pressed down firmly in 3-in. pots, and sow the seeds three to a pot pushing them in  $\frac{1}{4}$  in. apart and  $\frac{1}{4}$  in. deep. After watering, put the pots on the staging of the greenhouse, covering them with a sheet of glass or a piece of newspaper.

Wipe the underside of the glass every day and, when the seedlings are through, remove the glass altogether. A week later thin the seedlings down to one per pot and grow them on in the greenhouse until about the beginning of May. Put the pots out in a cold frame for the plants to harden off gradually before planting

out as for celery. Where a greenhouse is not available, sow three seeds every  $1\frac{1}{2}$  ft. in the bottom of the trench early in May; the seedlings should be thinned down to one per station later.

## PLANTING

Set the plants out  $1\frac{1}{2}$  ft. apart in the bottom of the trench and follow the planting by a good flooding with water. Cardoons, like celery, need an abundance of water.

## GENERAL CARE

Feed the plants with Liquinure or Bio Humus once every ten days throughout the season. Start this feeding at the end of June and finish at the end of September; on each occasion apply the diluted feed at the rate of a quart per yard run.

Early in October carry out the first earthing up. Remove the yellowing leaves at the base of the plants, then grip the plants tightly and bring the soil up to them firmly. As some of the plants have prickly stems, it is advisable to wear gloves when earthing up.

Carry out the second earthing about the third week of October. It should then be possible to pack the earth down with the back of a spade so that it forms a steep bank sloping at an angle of 45° on either side of the plants, to carry the excess moisture away.

If the soil is drawn right up to the bottom leaves it will blanch the stems and make them sweet. The first plants will be ready for use three weeks after the final earthing up.

The light can also be kept away from the stems if collars of brown paper 6 in. wide are tied round each plant just below the bottom leaves, before the earthing up. Another method of earthing up is to slip 6-in. agricultural drain pipes over the

tops of the plants, and then pour silver sand into the pipes to reach as far as the bottom leaves.

#### HARVESTING

Lift the cardoons as they are needed, but be sure to put back the soil so that the remaining plants are kept in the dark.

#### VARIETIES

There are no definite British varieties. Ask for French or Spanish cardoon seed.

For flavour, length of stems and hardiness, the French cardoon is preferable to the Spanish, but the latter is not prickly and is therefore easier to work with.

## CARROTS

Carrots may be grown in frames, under cloches or ganwicks or in the open. There are varieties with long tapering roots, varieties that are long but stump-rooted; short and intermediate stump-rooted kinds, and varieties like *Guerande* that are blunt-ended and broad-shouldered. It is important to choose a kind to suit the type of soil and cultivation. For instance, for shallow soils stump-rooted varieties are preferable.

#### SOIL PREPARATION

The best carrots are grown on deep, sandy loams such as are found in parts of Norfolk, Worcestershire, Kent, Surrey and Shropshire. Early carrots require sandy soil because it warms up quickly in the spring. Good carrots can, of course, be grown on much heavier soils—especially the main-crop varieties. Dig over heavy soil and leave it rough through the winter; it is more easily forked down in the spring after being weathered.

Do not dig in fresh manure for carrots, for it is likely to make the roots fork instead of growing long and straight; if they have to search for food they grow a better shape. Use land that was well manured for the previous season's crop. If the land is in poor condition, apply a complete fertilizer at the rate of 4 oz. to the sq. yd. Rake the fertilizer into the top  $\frac{1}{2}$  in. of soil a few days before sowing the seed.

#### SOWING

Carrots will not germinate in cold, wet soil. The earliest sowings in March should be made on a sunny, south border or in warm, sheltered, sunny spots. The alternative is to put cloches or ganwicks in position over a strip of land early in March and then, having thus warmed the soil, to sow the carrots about the third week in March. After germination, the cloches can either be left in position or removed to cover some other crop.

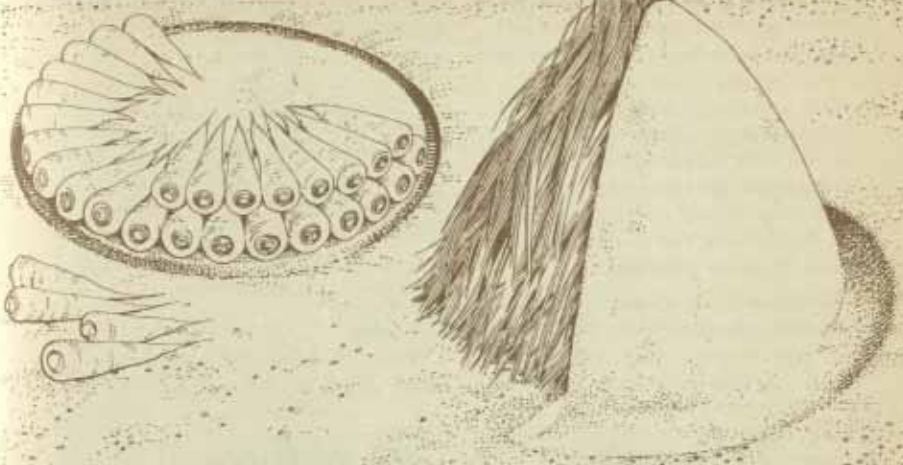
Make successional sowings—perhaps two short rows at a time—once a fortnight from the middle of March until the middle of April.

Mix the seed with an equal quantity of sand or fine sedge peat, so that a  $\frac{1}{2}$ -in. deep sowing can be made thinly, thus avoiding the need to thin the seedlings later. After sowing, rake lightly to cover the seed.

Carrots that are to be stored and used in the winter should be sown about the middle of April in drills  $\frac{3}{4}$  in. deep and 15 in. apart.

There is a third, main sowing period about the middle of July. At this time sow the quick-maturing varieties to ensure tender young roots for pulling in the autumn and early winter. This late sowing usually escapes carrot fly because this pest is at its worst early in June. Make this late sowing thinly in rows  $\frac{1}{2}$  in. deep and 1 ft. apart.

## A CARROT CLAMP



To store carrots out-of-doors, dig a shallow circular trench, 3 ft. in diameter, pile the carrots to a height of 3 ft. in the form of a cone, and cover the mound with layers of straw and soil. A twisted tuft of straw through the soil provides ventilation.

## CARROT FLY

Because females of the carrot fly lay their eggs on carrot seedlings at the time when the main crop would usually be thinned, sow three seeds every 6 in. along the rows to reduce the need for thinning. As an alternative, the new, pelleted seeds can be sown. These have a special coating round each seed, containing a carrot-fly repellent as well as plant foods, and as the pellets are large and easy to handle, thin sowing can be assured.

## GENERAL CARE

Use a Dutch hoe very lightly between the rows and hand weed as required. If thinning is necessary, try to do it in the evening, preferably in a showery spell.

Thinning is best done in two stages. On the first occasion, thin to 3 in. apart when the plants are 1 in. high and easy to handle. Thin again four weeks later to 6 in. apart; by that time the carrot thinnings should be fit to use even though

they are small. Dust between the rows with a gamma dust at an ounce to the yard run to keep the carrot flies away. Take great care not to let the dust drift on to the plants or they will be tainted. Do not leave the thinnings lying about, because the smell, as they decay, attracts carrot flies. Put them on the compost heap and sprinkle with a little fish manure; they will rot down and the smell of the carrots will be lost. After thinning, work the soil up to the plants in the rows and firm it with the hoe blade, as this helps to discourage carrot flies.

## HARVESTING

Pull the early varieties when they are young and tender but large enough to use. The pulling can continue over many weeks. Treat the July-sown varieties in a similar manner, but treat the main crop differently. Dig the roots up carefully before the winter frosts set in and grade the crop. Use split and damaged roots as soon as possible for they will not keep.



## VEGETABLES

Store perfect roots in deep boxes, putting in a layer of roots, a  $\frac{1}{2}$ -in. layer of sand, another layer of roots and so on. The boxes can then be stored indoors in a cool, dry place.

They can also be stored out-of-doors, like potatoes, in a clamp. It is important that the heap should not be more than 3 ft. high and 3 ft. wide at the base. Allow a 4-in. thick, twisted tuft of straw to peep out through the soil at the top of the clamp to provide ventilation.

### RECOMMENDED VARIETIES

Varieties can be divided into three classes: the short-rooted; the intermediate-rooted or half-longs; and the long-

rooted. Few long-rooted kinds are grown for general use; they are usually grown for exhibition.

### Short

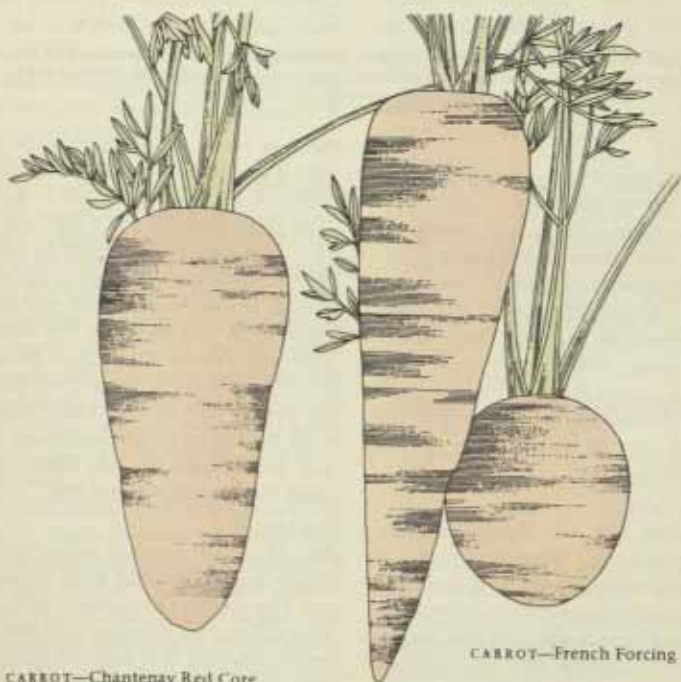
Early Horn, produces a good early crop. Stump-rooted.

French Forcing, roots almost spherical, orange-red flesh, crisp. Excellent for sowing in frames or under cloches.

Guerande, broad-shouldered, blunt ended, easily pulled. Orange-red. Early. Excellent in sandy dry soils.

### Intermediate

Amsterdam Forcing, roots 5 in. long, good under cloches. Excellent quality.



CARROT—Chantenay Red Core

CARROT—French Forcing

CARROT—Long Red Surrey

Autumn King, heavy stump-rooted, main-crop type. Rich, deep orange flesh.

Chantenay Red Core, half-long, stump-rooted. Early thick roots. Deep orange.

Early Nantes, long stump-rooted variety. Small indistinct core. Orange-scarlet. Early.

James's Scarlet Intermediate, the most popular main-crop variety, with

tapering roots. Good texture and colour.

New Red Intermediate, said to be an improvement on James's Scarlet Intermediate. Excellent in colour and quality.

St. Valery, a main-crop variety with long, red uniform roots of superb quality. Crops and keeps well.

*Long*

Long Red Surrey, huge, tapering, deep orange roots.

## CAULIFLOWERS

The true summer cauliflower is harvested between June and October.

It is not an easy vegetable to grow. It should never be planted too deeply; it requires plenty of moisture and needs to grow rapidly and unchecked. When the plants are checked in any way, they produce small white curds, often no bigger than a half-crown, which are almost useless.

### SOIL PREPARATION

Choose a plot of sandy loam; dig to a spade's depth and enrich it with well-rotted manure or old compost at the rate of one bucketful to the sq. yd. It is an advantage if cauliflowers follow a well-manured crop like potatoes or peas; the ground is firmer, and much of the manure which was incorporated for the previous crop will have fully decomposed and will provide a cool root run. If the soil is not already chalky or limy after the initial soil preparation, apply carbonate of lime as a top dressing at the rate of 5 oz. to the sq. yd.

Ten days before planting, apply an organic fertilizer such as meat and bone meal or fish manure at the rate of 3 oz. to the sq. yd., raking in lightly. In addition, wood ash may be given at the rate of 1 lb. to the sq. yd., or sulphate of potash at 1 oz. to the sq. yd.

### SOWING

Although a succession of broccoli can be maintained by sowing suitable varieties in the correct sequence, a succession of cauliflowers can be ensured by making three different sowings. Make the first in September, in frames, in soil which is made up as much like John Innes compost as possible. Sow the seed thinly by scattering (1/16 oz. of seed will produce at least 200 plants), and, if the compost is moist and firm, there will be no need to water until after germination has taken place. Sift a little compost over the seeds through a 1/4-in. mesh sieve. Keep the frame closed until germination takes place and then allow a little ventilation on mild days. When it is frosty keep the frame closed.

Make the second sowing in late January or early February in boxes containing John Innes seed compost. Keep the boxes on the staging of the greenhouse at a temperature of 50° F. (10° C.). When the seedlings come through, prick them out 1 in. square into other boxes containing similar soil. Let them grow on in their boxes, keeping them as near the glass of the greenhouse as possible to avoid letting them get too drawn. About the beginning of March put the boxes out into a frame to harden the plants off;



#### HOW TO PROTECT CAULIFLOWER HEADS

Cauliflowers that are ready but not wanted immediately may be left in the ground. Break the mid-ribs of two or three of the centre leaves on each head, and bend the leaves over so that they cover the curd like an umbrella and protect it until it is required.

when the plants are used to the outside air—by about the beginning of April—put them out where they are to grow.

The third and normal sowing for cauliflowers is made early in April, allowing  $\frac{1}{2}$  dram of seed for 100 plants. Prepare a seed bed in a sunny, sheltered spot by applying a fine sedge peat at the rate of a large bucketful to the sq. yd. and raking the soil down level, leaving the top particles of soil finer than grains of wheat. Take out  $\frac{1}{2}$ -in. drills with the corner of the draw hoe. After covering the seeds it is important to firm the soil over; this can be done with the head of the rake.

When the seedlings are through, dust with a B.H.C. powder, D.D.T. or lindane to prevent attacks by the black flea beetle. Whenever cauliflowers are transplanted it is most important to do the work shallowly, for if the bases of the leaves are buried a deformity called "blindness" occurs and the plants grow without real centres and consequently no curds develop. For this reason it is a

good idea to pot the plants in 3-in. pots when they are about 2 in. high, so that when they are put out into the garden there will be a minimum of disturbance to the root ball.

#### PLANTING

Plant out the earliest plants—those raised from autumn sowings—in late March,  $1\frac{1}{2}$  ft. square. Put out the January-sown plants about the middle of April, 2 ft. by 8 in. Plants from sowings made out-of-doors are not ready to be put out until the third week in June or in July, when they should be planted 2 ft. square. It is important to plant shallowly and firmly.

#### GENERAL CARE

As in dry periods it is invariably necessary to irrigate cauliflowers, it is not advisable to attempt to grow the crop unless facilities for providing water are available, especially if the soil is quick-drying. In dry weather the use of a square-area rainier for an hour or so once a week will avoid the need for much watering by hose or can.

Soot, which is particularly useful for



cauliflowers, may be given at 5 oz. to the sq. yd. when the plants have been in the soil a month. A second dressing of soot may be given three weeks later. Alternatively apply 2 oz. of dried blood to the sq. yd. These feeds ensure that the plants have the rapid steady growth which results in good, white curds.

#### HARVESTING

Cut the cauliflower early in the morning, if possible, while the curds are moist with dew. If a number of curds appear to be ready at the same time, break the mid-ribs of two or three of the centre leaves on each plant so that they cover the curd like an umbrella and protect it for a few days until it is required. If this does not hold back the curds sufficiently, pull up the plants, including the roots, when they are ready for use and hang them upside down in the potting shed; they will then keep for about three weeks.

#### RECOMMENDED VARIETIES

##### *For autumn sowing*

All the Year Round, a dwarf variety with large, compact heads of pure white.

Cambridge Early Allhead No. 7, of compact dwarf habit producing large heads.

Early London, is classed as a second early. Produces large heads.

Snowball, very early, dwarf compact heads; suitable for growing in frames or in the open.

##### *For January, February sowing*

Feltham Forcing, has upright foliage and large heads. Dwarf variety.

White King, early, medium-large with solid heads. Well protected by foliage. Uniform in shape and size.

##### *For outdoor sowing*

Early Veitch's Autumn Giant, large, firm, protected heads. Ready for cutting in September.

Morse's November, a good size cauliflower for November.

Veitch's Autumn Giant, a reliable variety with heads of splendid quality. Matures in October.

Veitch's Self-Protecting, large, white heads, well protected. Ready for cutting November or December.

## CELERIAC or TURNIP-ROOTED CELERY

Celeriac is really a swollen stem produced on the surface of the ground and it grows like a root crop. It looks like a very rough turnip and can be grown to quite a large size without being coarse. It is hardy and a good substitute for celery.

#### SOIL PREPARATION

Celeriac grows best in soil enriched with plenty of organic matter and will follow well after a crop like potatoes or peas. In this case fork the soil over lightly in April, adding old compost or well-rotted dung at the rate of one large barrowful to 8 sq. yds. Allow the ground to settle until a fortnight before putting out the plants.

At that time, fork in sedge peat 3 in. deep at the rate of one bucketful to the sq. yd., and give a good treading. Also, apply fish manure at 3 oz. to the sq. yd., or fork in a complete fertilizer at the rate of 4 to 5 oz. to the sq. yd.

#### SOWING

To grow good roots the seed should be sown during February in boxes of John Innes seed compost or Eclipse No-Soil compost in a greenhouse, with the temperature maintained at 65° F. (18° C.). Press down the compost level and firm, and as the seed is so small, sprinkle it thinly over the top. Sift a little more of

the compost over the top through an  $\frac{1}{4}$ -in. mesh sieve, or cover with a sprinkling of silver sand. After watering through the fine rose of a watering-can, place the boxes on the staging of the greenhouse and cover them with a sheet of glass or newspaper. Wipe the underside of the glass every morning and when the seedlings are through, remove it altogether.

When these seedlings are  $\frac{1}{4}$  in. high, prick them out, 1 in. apart, into other boxes containing similar compost. A week later place these boxes on shelving nearer the glass. Keep them in the greenhouse for another two or three weeks, and then put them into a cold frame to harden off. A week later plant them out.

#### PLANTING

Rake the surface level and plant the seedlings out  $1\frac{1}{2}$  ft. apart, with 1 ft. between the rows so that the roots are buried and the leaves are just resting on the soil surface. Shallow but firm planting is necessary as the swollen stems are produced above soil level.

#### GENERAL CARE

Hoe lightly between the rows to keep down weeds, and tend to draw the soil

away from the plants rather than towards them. In early November, begin drawing the soil towards the swelling stems to help blanch them and to give them protection.

If any side shoots or suckers are formed near the base of the plant in the early summer, remove them immediately.

The roots of celeriac will be small until they start to swell in late September or October.

#### HARVESTING

Dig up the roots as they are needed in the winter.

#### RECOMMENDED VARIETIES

Claudia, a short-leaved strain with completely globular roots. Extremely smooth and practically without side shoots.

Geneva 10, a popular Swiss variety. Roots are smooth and slightly conical. Foliage is short and spread out.

Giant Prague, a large, well-flavoured, turnip-shaped celeriac which can grow to a weight of 4 lb.

Marble Ball, has big roots. Average size, strong foliage. Resistant to disease and keeps well.

## CELERY

#### SOIL PREPARATION

Because celery requires a good deal of water, it does best in soil which is retentive of moisture—like the peaty soil found in the fen districts of Lincolnshire.

In December or January, if the weather is favourable, dig out a trench  $1\frac{1}{2}$  ft. wide and 16 in. deep and throw the soil on either side of the trench equally so that two ridges are formed. Pat down the tops of these ridges with the back of the spade so that they are level, and sow

along them a catch crop of radish, lettuce, spinach or even french beans. In this way the trench soil is not wasted. If more than one trench is needed, dig the next one at least  $2\frac{1}{2}$  ft. away.

Into the bottom of the trench put a 6-in. layer of old dung or well-wetted farmyard manure. On top of this thick base of organic matter put a 5-in. layer of good soil and allow it to settle to within about 6 in. of the surface level. Then apply fish manure over the soil at the rate of 4 oz. to the yard run. During the



Dig a trench  $\frac{1}{2}$  ft. wide and 16 in. deep, and throw the soil on either side to form two ridges. Then place a 6-in. layer of manure in the trench followed by a 5-in. layer of good soil

growing season apply Liquinure every few days using a 2-gal. watering-can for a 2-yard run.

#### SOWING

Because celery is liable to the seed-borne blight disease, it is important to buy disease-free seed from a reliable seedsman. The alternative is to sterilize the seed by immersing it for three hours in a 10 per cent solution of formaldehyde and then drying it off very slowly.

Make the earliest seed sowing about the middle of February. Sow in boxes of Eclipse No-Soil or John Innes seed compost at a temperature of 60 to 65° F. (16 to 18° C.) in a greenhouse. Because the seed is tiny it should be hardly covered before it is pressed down with a wooden presser into the soil. Cover the box with a sheet of glass or piece of newspaper. If glass is used, remove it each day for wiping and, when the seedlings are through, remove it altogether. When the seedlings are about  $\frac{1}{4}$  in. high, prick them out 3 in. apart into boxes (at least 3 in. deep) filled with John Innes potting compost No. 1. Press the compost down firmly in the boxes and rake level. These greenhouse-raised plants need to be hardened off, so

put them out in cold frames a month before they are planted out.

If a greenhouse is not used, the seed can be sown under cloches or ganwicks out-of-doors late in March or early April. Incorporate fine sedge peat at 2 bucketfuls to the sq. yd. and rake the soil level. To warm up the soil put the cloches or ganwicks in position a fortnight before sowing. Sow the seed thinly and evenly over the soil and sift a little John Innes compost over the top through an  $\frac{1}{4}$ -in. mesh sieve. Press the soil down lightly. Cover the glass of the cloches or ganwicks to exclude light during the day until germination takes place. Leave the seedlings to grow under the glass, thinning them as necessary, until it is time to plant them out in the trenches.

#### PLANTING

In early June, when the seedlings are 3 or 4 in. high, plant them out in trenches. Make holes with a trowel 1 ft. apart in the centre of the bottom of the trench, and take care to firm the roots of the plants in well. Half-fill the trench with water after planting to encourage firmness, especially in the case of loamy or heavy soils.

#### GENERAL CARE

If the weather is dry, soak the trench again ten days after planting out, because the roots of celery must never be allowed to dry out. A month after planting out begin feeding the row with liquid Bio Humus or Liquinure every ten days. Keep the ridges hoed and free from weeds and remove any side growths or "suckers" coming up from the base of the plants, as they are valueless. Because leaf spot or leaf blight disease may break out, it is advisable to spray with a copper fungicide three times during the growing season at fortnightly intervals, starting towards the end of August.

Some protection should be given to



late celery plants in the winter. In December, therefore, cover the tops with bracken or dry straw, or if barn cloches are available, put them over the tops of the celery trenches. It is important to stop rain trickling down into the celery hearts, otherwise they may start to rot.

#### EARTHING UP

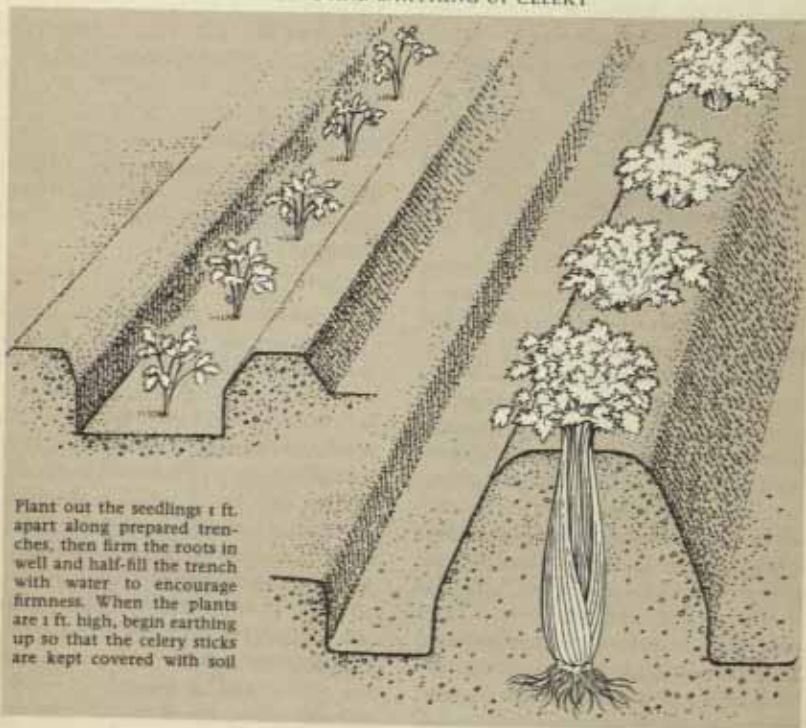
The heaviest work in growing celery is earthing up. Start about the middle of August when the earliest plants are 1 ft. high. Clear the catch crop from the tops of the ridges and fork the soil a little to pulverize it finely. Firm this into the trenches to a depth of 6 in., to prevent the soil falling into the centres of plants or between the stems. Grip each plant

firmly with one hand, and build up the soil round it with the other.

Carry out the next earthing up three weeks or a month later: once more fork the earth on the ridges until it is fine and then draw it up with a draw hoe towards the plant stems as high as the bottom leaves. Pat the sides of the earthed up ridges with the back of a spade so that they are left sloping smoothly away from the plants. Rain will not penetrate into the plants but will run away down the smooth sides. Make a third earthing up in October. At each earthing up make sure that the ridges are smooth and steep.

It is generally considered that if the soil touches the celery sticks they will

PLANTING AND EARTHING UP CELERY



Plant out the seedlings 1 ft. apart along prepared trenches, then firm the roots in well and half-fill the trench with water to encourage firmness. When the plants are 1 ft. high, begin earthing up so that the celery sticks are kept covered with soil

have a better flavour. If the plants are being grown for show, wrap each plant in paper before the soil is drawn up, to keep the stems clean and white.

To save gripping the stems a strong rubber band can be slipped over each celery plant. As the earthing up progresses, move the rubber band up a little higher. Alternatively the stems may be tied with raffia.

#### HARVESTING

Do not use celery until the stems are white; this is usually at least eight weeks after the first earthing up. As each celery plant is dug up for use, the soil should be replaced so that the adjacent plant is not exposed to light which will turn it green. Shake the soil from the plant and put the roots on the compost heap.

#### RECOMMENDED VARIETIES

There are three main types of celery—red, pink and white. In all cases be sure to buy sterilized seed.

##### *Pink*

Clayworth Prize Pink, has crisp heads of good quality. Medium size. Does not go to seed as quickly as other kinds.

##### *Red*

Standard Bearer Red, has crisp, solid heads of excellent flavour. Late.

##### *White*

Clandon White, is popular because it is reasonably immune from disease. Good flavour.

Sandringham White, has solid, dense heads of strong flavour. Late and good.

Wright's Giant White, a tall, vigorous grower with solid, crisp heads.

Wright's Grove Giant White, is more resistant to frost than any other kind.

#### SELF-BLANCHING CELERY

This is a type of early celery that is less hardy and has less flavour than the normal kind. It can be grown for use only in September and October, and has to be

cleared before there is any serious risk of frost. This celery can be grown on the flat and does not need earthing up.

#### SOIL PREPARATION

Dig over a strip of ground and add well-rotted compost or old dung at the rate of one large bucketful to the yard run. A week before planting, lightly rake in a fish manure with a 5 per cent potash content at the rate of 4 oz. to the sq. yd.

#### SOWING

Because the plants are quick to mature, do not sow the seed before the middle of March. Sowing is otherwise the same as for celery.

#### PLANTING

Instead of putting the plants out in rows, plant in a square or patch, spacing the plants out 9 in. apart each way. Thus the plants will shade each other and help to keep the stems white. Plant out firmly at the end of June or the beginning of July and flood the ground after planting.

#### GENERAL CARE

Keep the plants growing steadily at all costs: if the weather is dry, use a square-area rainer to give artificial rain once a week, or water with the hose as and when necessary. Because the plants grow so close, weeds cannot grow. Put straw among the plants at the end of August to help keep the stems white.

#### HARVESTING

Start to use the plants at the end of August. As one plant is removed from the end of the plot, fill in with straw to keep light from the remaining plants. As the celery does not keep well, use it immediately.

#### RECOMMENDED VARIETIES

Golden Plume, a French variety that is not easy to obtain. It is disease-resistant and non-bolting.

Golden Self-Blanching, a compact dwarf with solid heads and yellowing leaves. Generally free from stringiness.

## CHICORY

Chicory is grown as a salad crop, and is forced in the dark. This chicory should not be confused with the blue-flowered, wild chicory seen in hedgerows and herbaceous borders, nor with Magdeburg chicory, the thick roots of which are roasted and blended with coffee.

## SOIL PREPARATION

Chicory does best on a rich, light, loamy soil, but will grow on other soils if they are liberally enriched with fully decayed animal manure or a good compost. In the spring, dig in one of these organic manures at the rate of one large bucketful to the sq. yd. Then, as the ground is forked down lightly and trodden firm, apply a fish manure with a 6 per cent potash content at 3 oz. to the sq. yd. If the ground is not chalky or limy, cover the surface with carbonate of lime at 6 oz. to the sq. yd.

## SOWING

If the ground is prepared early, it may first be used for a crop of radish, spinach or lettuce. In late May in the north and early June in the south, sow the seed thinly in drills 1 in. deep and in rows  $1\frac{1}{2}$  ft. apart. Three weeks later thin the seedlings down to 1-ft. intervals.

For "station sowing", sow three seeds together at 1-ft. intervals along the drills, and sow radish seed as an inter-crop between the stations. Rake the ground lightly to cover the seed and firm heavily with a rake head over the drills to make certain the seed is firm.

## GENERAL CARE

There is little to do in the summer and autumn other than to hoe lightly with a Dutch hoe to a depth of  $\frac{1}{2}$  in., in order to provide a dust mulch and to keep down the weeds. Chicory is naturally very

deep-rooted and usually finds its own water.

Lift roots in October, November and December for forcing. Store in a frost-proof shed, and in the following few weeks force a small number at a time. To force chicory, cut off the tops to within an inch of the crown; pot up 2 to 3 in. apart in any ordinary fine soil (say four roots to an 8-in. pot) with the crowns 1 in. above the soil. Place the pots under the staging of the greenhouse or in a heated frame where a temperature of 50° F. (10° C.) can be maintained. Put an upturned pot of the same size over each pot, remembering to plug the drainage hole with a cork. Tack sacking to the edge of the staging to form a complete screen. The result of encouraging the plants to grow again in heat and complete darkness is that they produce fine hearts of golden leaves, known as "chicons".

Cut the hearted chicons when they are about 6 in. long. The chicons are usually ready about three to five weeks after forcing begins. To keep up a succession of chicons during the winter, pot a dozen or so roots every week.

If the roots are left in the pots, there will be a second crop of leaves, but these will be quite small and will not form another heart. Often, however, they are worth gathering, especially when salads are scarce in January or February. At the end of the second cutting, the roots are useless; chop them up and put them on the compost heap.

## RECOMMENDED VARIETY

Whitloof de Brussels, bears large, thick-stemmed leaves in the summer and produces long golden chicons when blanched.



## CORN SALAD

Sometimes called "lamb's lettuce" or the "salad of the priest", corn salad looks like forget-me-nots when it is growing—without the blue flowers. The leaves are eaten raw in salads.

## SOIL PREPARATION

Corn salad will grow on most soils but for better results fork in one-year-old animal manure or fully composted vegetable waste at one good bucketful to the sq. yd. Fish manure or a complete fertilizer can be added at the same time, at 4 oz. to the sq. yd. Finally, just before seed sowing, dust the soil with lime.

## SOWING

Because corn salad grows largely in the autumn and early winter, choose a warm, sunny position and, having raked the soil down finely, sow the seed thinly in drills  $\frac{3}{4}$  in. deep and 1 ft. apart. To ensure a succession of supply, start seed sowing in August and continue once a fortnight until the end of September. When the seedlings are large enough to handle, thin them out to 9 in. apart in

the drills; excess seedlings may be transplanted to fresh drills if desired.

## GENERAL CARE

Use a Dutch hoe lightly between the rows, and in the late summer, if it is very dry, use overhead irrigation apparatus once a week for 45 minutes.

## HARVESTING

The usual method is to pull up whole plants and use all the leaves at one time; when the plants have been grown quickly the leaves are very tender. Alternatively, if the seedlings are first thinned out to  $\frac{1}{2}$  in., and then thinned later to 9 in. apart when the plants need extra room, the thinnings are particularly tasty.

## RECOMMENDED VARIETIES

French Cabbaging, very hardy. Dark green leaves in attractive rosettes.

Italian Lettuce Leaved, only suitable for the south and south-west. Excellent flavour.

Large-Seeded English, very hardy. Large greyish-green leaves. Particularly suited to the Midlands.

## RIDGE CUCUMBERS

Ridge cucumbers may be started in a greenhouse or grown entirely out-of-doors. For greenhouse sowing see *The Use of Glass in the Garden*.

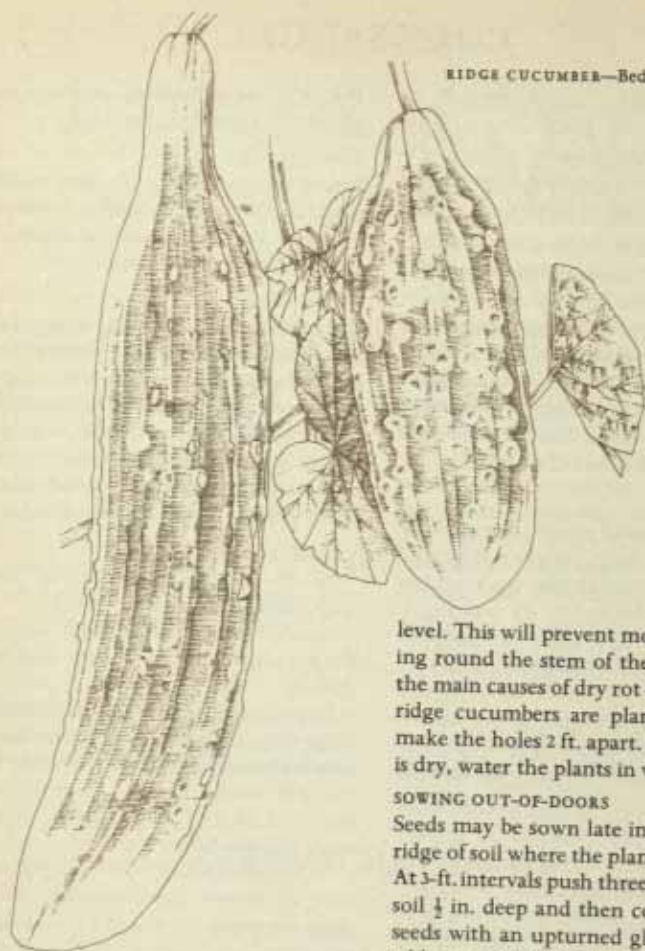
## SOIL PREPARATION

All cucumbers do best in soils that are rich in organic matter. Therefore dig the ground in the autumn to a spade's depth and leave it rough. Seven days before the cucumbers started under glass are to be planted out, which should be at the end of May when the fear of frosts has passed, prepare a trench 9 in. deeper

than the depth of a spade. Place a layer of well-rotted compost or old farmyard manure in this trench and tread it down until it is 4 in. thick. Put back all the soil so that a ridge is formed. It is into this ridge that the plants are set.

Alternatively, if a long row is not required, individual holes may be prepared, 3 ft. apart, to a spade's depth and a spade's width. At the bottom of each hole, place a layer of well-rotted compost 4 in. thick. Replace the soil to form small mounds.

RIDGE CUCUMBER—Bedfordshire Prize

**PLANTING**

Harden off plants that were started in the greenhouse, before planting them out (see *The Use of Glass in the Garden*).

Knock the plants carefully out of their pots so as not to disturb the ball of soil. Remove the crocks at the base of the ball if any are present. Use a trowel to prepare a hole of exactly the same size as the ball, but be sure to plant so that the top of the ball of soil is  $\frac{1}{2}$  in. above soil

level. This will prevent moisture collecting round the stem of the plant, one of the main causes of dry rot disease. Where ridge cucumbers are planted in a row make the holes 2 ft. apart. If the weather is dry, water the plants in well.

**SOWING OUT-OF-DOORS**

Seeds may be sown late in May into the ridge of soil where the plants are to grow. At 3-ft. intervals push three seeds into the soil  $\frac{1}{2}$  in. deep and then cover the three seeds with an upturned glass jam jar to add warmth and to give protection. Keep the jar in position until the plants are well established. Thin down to one plant per station should all three grow.

**GENERAL CARE**

Pinch back the top  $\frac{1}{2}$  in. of each plant after seven leaves have formed, to encourage the production of side growths. Male flowers need not be removed.

Cucumbers are surface-feeding plants and the soil round them should not be hoed. Apply  $\frac{1}{2}$  in. of fine sedge peat for

1½ ft. round each plant, or use very fine compost. Always keep the plants well watered but never let water collect round the stems. Always water with a fine spray so that the soil will not be washed away and the roots exposed.

From the moment the first fruits are 3 in. long, feed the plants once a week with one of the bottled liquid manures such as Bio Humus or Liquinure.

#### HARVESTING

Cut the cucumbers as soon as they are ready to use. Cucumbers store well, so

cut regularly as this will encourage regular cropping. Never leave old fruits on the plants to go to seed.

#### RECOMMENDED VARIETIES

Bedfordshire Prize, hardy. Very prolific. Deep green fruits.

Boston Pickling, short, bright green, smooth fruits. Excellent as a pickle.

Country Giant, produces longer roots than the normal ridge types.

King of the Ridge, a normal heavy-cropping ridge type. Hardy, vigorous and practically spineless.

## EGG PLANTS *or* AUBERGINES

A member of the potato and tomato family the egg plant originated in the West Indies. The egg-shaped fruits, which may be white or purple, are popular in France, where the name aubergine originated. The purple varieties have a better flavour than the white kinds. Egg plants grow best in loamy soil which is not only rich in organic matter, but is also warm. It is therefore an advantage to grow them under square glass ganwicks or cloches for a little while after planting out.

#### SOIL PREPARATION

About the middle of April dig well-rotted dung or compost into the ground at the rate of one large barrowful to 8 sq. yds. See that it is buried about 9 in. deep. Fork into the top-soil (about 4 in. deep) fine compost or sedge peat at half a bucketful to the sq. yd., and, at the same time, add a fish manure or a meat and bone meal at 4 oz. to the sq. yd. Then allow the soil to settle.

#### SOWING

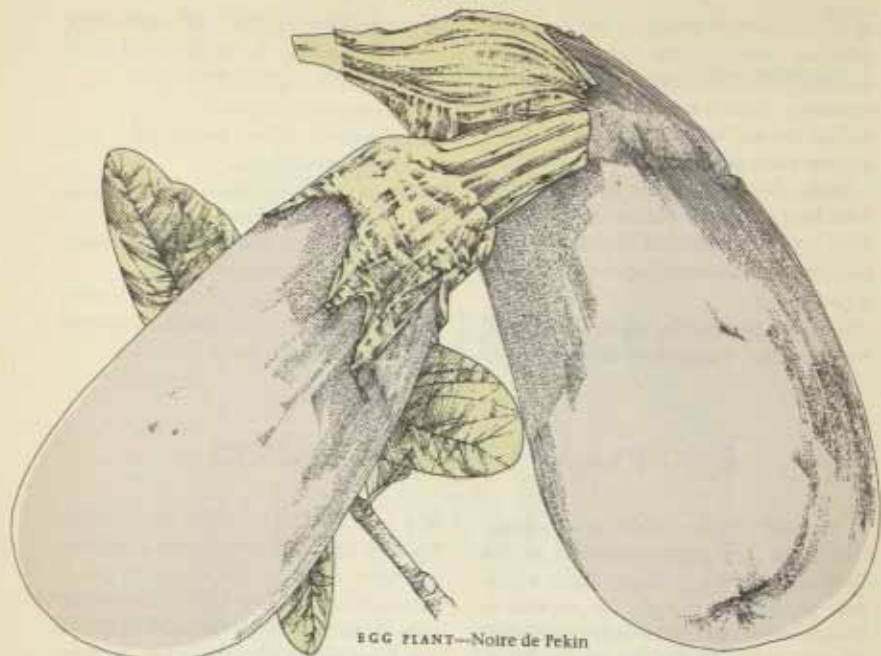
Start the plants by sowing the seed about the middle of February in the greenhouse, at a temperature of 60° F. (16° C.). Sow three seeds ½ in. deep in the centre

of a 3-in. pot firmly filled with Eclipse No-Soil or John Innes seed compost, and thin down to one plant per pot a fortnight later. Grow the plants on in the pots on shelves as near as possible to the top glass of the greenhouse to prevent them from being dwarfed. About the third week of May transfer them to a cold frame, with a protecting glass light overhead, and then gradually open up the light as the days get warmer and longer. About the middle of June, remove the frame light altogether, and a week later put the egg plants out in the warm spot in the vegetable garden where they are to grow.

#### PLANTING OUT

Carefully knock out the plants from their pots, so that the root balls remain intact. With a trowel, make holes big enough to take the balls of soil without disturbing the roots. Plant firmly in rows 1½ ft. apart, with 15 in. between the rows, pinching out the top inch of each plant to encourage branching. If more than six fruits form on one plant thin them down to this number, always leaving the best on the plant.





EGG PLANT—Noire de Pekin

#### GENERAL CARE

As egg plants are often attacked by red spider, which cluster on the underside of the leaves and suck the sap, thus causing the foliage to turn brown, spray the underside of the leaves with water every day and put on the surface of the ground a 1-in. layer of damp sedge peat for 6 in. round each plant. In bad cases syringe with liquid derris.

#### HARVESTING

Pick off the fruits when they are the size

of a large hen's egg or, in the case of the longer varieties, when they are about 4 in. long and 2½ in. across.

#### RECOMMENDED VARIETIES

Blanche Longue Chine, produces a long white fruit.

Blue King, bears rich, tender round fruits.

Melanzana, produces round red-violet fruits.

Noire de Pekin, produces long, dark violet fruits.

## ENDIVES

Endives make excellent salad for the winter. The plants should be blanched to lessen their bitter taste.

#### SOIL PREPARATION

Because endives grow largely in the autumn they can follow an early crop,

preferably one like potatoes, for which the ground was well manured. Apply a fish manure at 3 oz. to the sq. yd. or a complete fertilizer at the same rate and then rake the surface level. Tread down the ground at the same time, and unless

the soil is already chalky apply a light dressing such as carbonate of lime evenly at 4 oz. to the sq. yd.

#### SOWING

Endives grow best in a position where there is plenty of sun in the late autumn or early winter. Make the drills  $\frac{1}{2}$  in. deep and 1 ft. apart and sow the seed in June very thinly in these rows. Later thin out the seedlings to at least 10 in. apart.

It is also possible to sow the seed in late July in narrow seed beds which have been enriched with fine sedge peat lightly raked in at the rate of half a bucketful to the sq. yd. Make the drills 6 in. apart only and sow the seed thinly. When the seedlings are about 1 in. high transfer them to the bed where they are to grow, in rows 1 ft. apart, with 10-in. intervals in the rows. This second method takes longer, but it does allow the gardener to plant out endives after the second-early potatoes have been harvested.

#### GENERAL CARE

Endives should never be allowed to suffer from lack of water, so in a dry August or early September use a square-area rainer to give the ground a good soaking for an hour at least once a week. Hoe very lightly with a Dutch hoe between the rows to keep down weeds.

To make certain that the plants are not bitter, blanching must be done three weeks before the endives are to be cut, that is about three months after sowing. The simplest way of blanching is to use a

number of 8- or 9-in. flower pots, block up the drainage holes with corks and put a pot over each plant. Once the green colouring matter has been driven out of the leaves, cut endives will not keep; so do the blanching in succession, a few plants at a time. Make sure that the plants are dry at the time they are covered up or they may rot. Because lettuces are scarce in November start blanching about the third week in October.

#### HARVESTING

Cut the blanched endives as close to the ground as possible leaving the roots in the soil.

#### RECOMMENDED VARIETIES

There are two main types of endive, the curled, sometimes called the Staghorn, and the Batavian, sometimes called the lettuce-leaved. In each group there are white and green varieties.

Batavian Green, compact, hardy, hearting variety with broad, thick, tender leaves.

Batavian White, more delicate in flavour and slightly less hardy than Batavian Green, but crisp and tender.

Green Curled, a larger variety with beautifully cut and curled leaves, and broad mid-ribs.

Moss Curled Green, a compact and very curled variety. Rather tender and often requires protecting by cloches or ganewicks.

Moss Curled White, finely curled with pale leaves. An epicure's variety.

## KALE or BORECOLE

Kale or borecole is a most useful winter vegetable and belongs to the cabbage family. It is very hardy and the plants will live through the severest winters, producing plenty of green tops for use

in January, February, March and early April. Kale will grow in the poorest of soils and the plants are hardly ever attacked by the dreaded club root disease which attacks brassicas generally. But

good drainage is necessary, as the roots have to maintain the plants throughout the winter.

#### SOIL PREPARATION

Very little soil preparation is necessary. Kale can usually be planted out after early potatoes or early peas without any particular manuring. If the soil is extremely poor, however, rake in fish manure as a complete fertilizer at 2 oz. to the sq. yd. before planting.

#### SOWING

Sow seed early in May in the south of England and early in April in the north. As with the other members of the cabbage family, sow the seed thinly in a seed bed, in drills 9 in. apart and 1 in. deep. Thin out the plants to 1 in. apart when they are 1 in. high. In case there may be gaps to fill later on, transplant some of the thinnings into a temporary seed bed 6 in. square in a sunny position.

A variety that does not require a special seed bed is Hungry Gap, which does best if the seed is sown where the plants are to grow. Sow during the first half of June, in drills 1 in. deep and 2½ ft. apart. Sow three seeds every 2 ft. along the drill. When the seedlings are 2 in. high, thin them to one per station. Another variety, Asparagus Kale, can be sown in the south as late as the end of June; plant it out a month later.

Normally, kale is planted out during June or early in July, as the earlier vegetable crops are harvested and the land becomes vacant. With the dibber, make holes 1½ ft. apart in rows 2½ ft. apart. If the soil is dry, pour a large cupful of water into each hole at planting time. Firm the plants in with the heel.

#### GENERAL CARE

In districts where the cabbage root maggot causes trouble, use aldrin as a seed-dressing or sprinkle a little calomel dust

round the plants at planting time. In dry weather use overhead irrigation for an hour or so on the tenth and twentieth days after planting.

#### HARVESTING

Kale should be left to grow unrestricted until the middle of January. Then cut out the central part of each plant, to encourage the development of side-growths. It can be kept growing in this way till well into April.

#### RECOMMENDED VARIETIES

Asparagus Kale, a hardy, late dwarf type which produces a profusion of tender shoots in the spring. These shoots arise in the axils of the frilly leaves and are very tasty.

Cottager's, grows 2½ ft. high. The leaves are crimped and curled along their edges and after a hard winter are often purplish in colour. Tender shoots or sprouts are produced in March or April.

Green Curled, has intensely curled leaves; the plants are of medium height and compact. One of the typical Scotch kales which withstands frosts well.

Green Curled Dwarf, is the best variety for small gardens, because it grows only about 1½ ft. high and produces masses of curly leaves of excellent quality.

Hungry Gap, one of the tallest kinds. A good variety for colder areas, it will survive the hardest winter and is often not used until May or June. The leaves are dark green and much curled.

Ormskirk Heading, an exceptionally hardy variety, popular in Lancashire and Cheshire. Dwarf and robust. A rather loose type of heart is produced, and the leaves have a thick mid-rib.

Ragged Jack, has dark green, deeply-cut leaves with crowded foliage especially at the tops of the plants. A northern variety, much grown in Northumberland and Westmorland and in parts of Scotland.



## KOHL RABI

Kohl rabi is regarded as a root crop but most of its root is really a swollen stem and grows above ground. It is popular in the East and in Germany. Sometimes called turnip cabbage or knol-kohl, it is a rapid grower and so makes a good catch crop. It should never be grown slowly or the roots will become tough and stringy, and it should never be grown too large for then it will be coarse and disagreeable. At its best kohl rabi tastes like turnip with a nutty flavour.

### SOIL PREPARATION

Kohl rabi is an excellent vegetable for a light sandy soil, provided that it is given well-rotted compost at the rate of a bucketful to the sq. yd. and fish manure with a 6 per cent potash content at 3 oz. to the sq. yd.

It will also grow quite well on heavy soils, if, in addition to compost, sedge peat is forked into the top 2 or 3 in. of soil at the rate of half a bucketful to the sq. yd. In both cases give lime as a top dressing at 7 oz. to the sq. yd., except in the case of chalky soils.

### SOWING

Make the first sowing in mid-March in

the south and in early April in the north. Successional sowings can be made every three weeks and, for the winter, a sowing can be made as late as the third week of August in the north and early in September in the south.

Sow thinly in drills 15 in. apart,  $\frac{1}{2}$  in. deep, and thin out the plants to 6 in. apart when the seedlings are 1 in. high. Make a second thinning, to 1 ft. apart, when the plants are half grown.

### GENERAL CARE

Because kohl rabi is a member of the cabbage family it is necessary to take precautions against club root disease (described in *Plant Diseases*). Turnip flea beetles may also be a nuisance, attacking the plants and pitting the leaves; deal with them by dusting liberally with fresh derris, D.D.T. or lindane.

When hoeing between the rows, take care not to injure the leaves. Hoe lightly, drawing the soil away from the roots rather than up to them.

### HARVESTING

The roots should be pulled when they are about the size of tennis balls. They should pull easily.

## LEEKs

Leeks are one of the easiest vegetables to grow. When they are harvested in the winter, cut off their long fibrous roots and leave them to rot down; they will quickly produce fine organic matter for any crop that is to follow.

### SOIL PREPARATION

Leeks do well on almost any soil, but a deep medium loam that has been well worked is best.

The ground should be well drained because the plant has to grow in the winter and will not tolerate stagnant soil conditions. Acid soil should be treated with carbonate of lime as a surface dressing, before planting out at 6 to 7 oz. to the sq. yd.

When preparing the ground, dig in well-rotted compost at the rate of one large barrow-load to 8 sq. yds., and bury

it at about a spade's depth. A fortnight before planting out add a fish manure at 3 oz. to the sq. yd. Leeks repay generous treatment.

#### SOWING

Sow the seed in a narrow strip of land prepared as a seed bed. Lightly fork in sedge peat or fine compost at the rate of one bucketful to the sq. yd., and then tread the ground before raking level. Make shallow drills  $\frac{1}{2}$  in. deep and 6 in. apart, and sow the seed thinly. It is quite a good idea to whiten the black seed with a little lime before sowing; this makes it easier to see the seed and to ensure that it is sown thinly. If seed is sown about the third week in March, plants will be ready to put out about the third week in June and even as late as early July.

#### SOWING IN BOXES

For very early leeks sow the seed in boxes of John Innes seed compost at the end of January. Press down the compost with a wooden presser so that it is firm and level and within  $\frac{1}{4}$  in. of the top of the box. Space out the whitened seed in 1-in. squares and sift a little more of the compost over the top through a  $\frac{1}{4}$ -in. mesh sieve. Use the wooden presser again lightly.

When the plants are 1 in. high, prick them out 2 in. apart into other seed boxes of John Innes potting compost No. 1. After watering, place them on a shelf of the greenhouse as near the glass as possible. The temperature when sowing and pricking out should be 55° F. (13° C.). At the end of March start the hardening-off process by putting the boxes into a frame; from there, plant out in the third week of April or early in May.

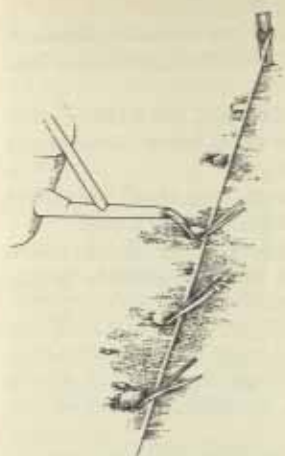
#### PLANTING

Leeks may be planted in trenches or on level ground.

For show leeks or for extra large specimens, trench planting is better.



LEEK—Musselburgh



#### PLANTING LEEKS

Make holes 6 in. deep and 6 in. apart, drop one plant into each hole and fill the holes with water. The watering will wash down enough soil to cover the roots



#### TYING LEEKS FOR BLANCHING

A few weeks after planting, tie a paper collar round each plant to exclude light from the lower part of the stem and so blanch the leeks while they are growing

Take out a trench 1 ft. deep and 1 ft. wide and bury in it well-rotted compost or dung at the rate of one bucketful to the yard run, forking in to a depth of 4 in. Tread well and then put back 3 in. of the soil, leaving the rest on either side of the trench. Put the plants out 1 ft. apart down the middle of the trench, burying the roots about 1 in. deep. If more than one trench is required, they should be 1½ ft. apart.

Normally, leeks are planted on level ground in June and early July. With a dibber make holes in the prepared soil, 6 in. deep and 6 in. apart for leeks needed before Christmas; 6 in. deep and 9 in. apart for a later crop. Water the seed bed well *the day before* getting up the plants.

To transplant, fork up the plants carefully, and cut back the tops by a quarter and the roots by about half. Drop one plant in the bottom of each hole and fill the hole with water. Do not firm the plant in, and do not put any soil in the

hole. The watering will wash down enough soil to cover the roots.

#### GENERAL CARE

Hoe lightly between the rows with a Dutch hoe during the summer and early autumn. Cut off with a knife or sharp secateurs any flower stems that appear. Three weeks after planting apply a fish manure at the rate of 2 oz. to the yard run or, better still, dried poultry manure at 1 oz. to the yard run. Alternatively, top dress with 2 oz. superphosphate and 1 oz. sulphate of potash at the rate of 2 oz. to the sq. yd. In a dry year leeks need water; use a square-area rainer on them for three-quarters of an hour once a week.

Where leeks are grown in trenches it is necessary to earth them up gradually. Put about 1 in. of soil into the trench a month after planting, another inch of soil a month after that and so on. Gradually draw the soil up the plants from a ridge on either side to earth up the stems, but



do not bury the leaves themselves. Corrugated cardboard tied round the stems before earthing up will prevent the leaves from being gritty when taken into the kitchen.

#### HARVESTING

The earliest leeks can be dug up for use at the beginning of October. Loosen the soil round each plant with a fork before pulling it out. When harvesting leeks grown in trenches, put the soil back so that the remaining leeks stay in the dark.

#### RECOMMENDED VARIETIES

Acquisition, an extra-long-stemmed variety. Leaves golden-green, much used for shows.

Lyon, large, solid, thick stems; wide, strong, dark green leaves. Useful variety for exhibiting.

Musselburgh, long, thick, ivory stems of excellent flavour. Very hardy.

Northumbrian, very broad leaves; stout white stems of medium length. Mild flavour.

## LETTUCES

If the right varieties of lettuce are chosen for sowing at the right time, it is possible to harvest lettuces out-of-doors from May until late October and, after that, from ganwicks, continuous cloches or Dutch lights. To produce crisp, succulent lettuces, the soil should be rich in manure. The best results are obtained by sowing where the plants are to grow rather than by transplanting—and this is especially true of the later sowings.

There are two main types of lettuce, cabbage and cos, but there are many varieties. There are, for instance, tall cos and dwarf cos, and varieties like Little Gem which seem to be a cross between cos and cabbage lettuce. In the cabbage lettuce group are the smooth light green types known as "butterheads" and the crimped, crisp-leaved types known as "icebergs".

Because the care of lettuces differs in summer and winter, the two methods of growing are dealt with separately.

### SUMMER CABBAGE LETTUCES

#### SOIL PREPARATION

Soil for summer lettuces must contain plenty of fine organic matter. Dig in old

manure or well-rotted compost at the rate of two 2-gal. bucketfuls to the sq. yd. when the soil is being prepared in the autumn. A week or so before seed sowing, fork in (no deeper than 2 in.) fine sedge peat at the rate of one bucketful to the sq. yd. This will ensure that the seedlings grow quickly without any check. When a tilth is being prepared, lightly rake in fish manure or meat and bone meal at 4 oz. to the sq. yd. Finally, dust carbonate of lime over the surface of the ground at 5 oz. to the sq. yd., unless the land is chalky.

#### SOWING

Sow the seed (from the middle of March in the south and from the beginning of April in the north) in drills 1 ft. apart and  $\frac{1}{2}$  in. deep. Make sowings every 14 days until the middle of July. This will ensure that a succession of well-hearted lettuces is kept up. In small gardens, sow a quarter of a row or half a row at a time.

#### EARLY PLANTS

It is possible to sow seed in boxes containing John Innes seed compost in a greenhouse at a temperature of 55° F. (13° C.) in January. When big enough, plant out the seedlings 2 in. square, in frames or

under cloches, so that by early March the plants may be set out in rows 9 in. apart. Great care should always be taken when handling lettuce plants because they bruise so easily. Always pull them up by the roots and hold them by the collar.

#### GENERAL CARE

When the weather is dry, water with a square-area rainer for an hour once a week, to keep the lettuces growing, or water well with the rose on the watering-can. Thin the plants out early to 9 in. apart so that there is never any check to growth. Small varieties like Tom Thumb need be thinned to only 6 in. apart.

#### HARVESTING

Cut fully-hearted lettuces first thing in the morning while the dew is still on them. Use a sharp knife and make the cut just below the bottom leaves. Never leave plants in the rows once they have started to bolt or they will go to seed. If too many lettuces are ready together put those not required on the compost

heap where they will help to rot down other material.

#### RECOMMENDED SUMMER CABBAGE VARIETIES

All the Year Round, very hardy and particularly resistant to dry weather conditions. Medium-sized, solid and tender.

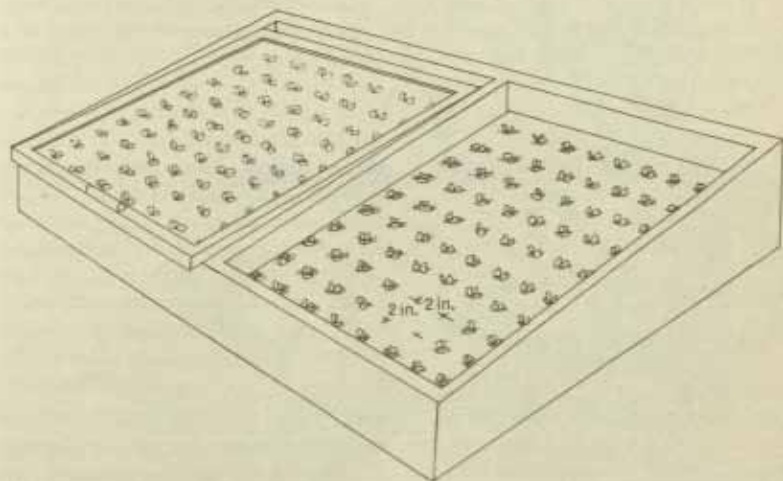
Borough Wonder, may be sown in spring or summer. Solid hearts; pale green colour.

Continuity, very long standing, excellent for dry, light soils. Leaves have a reddish-brown tinge which may be considered unattractive.

Great Lakes, a particularly flavorous kind with crisp, crinkly foliage. Stands well in hot weather. Very large.

Iceberg, leaves crimped and fringed. Light green but tinged with a reddish-brown. A good summer dry-weather variety.

Salad Bowl, a loose-leaved variety, of medium green colour. Does not produce a heart.



LETTUCE SEEDLINGS IN FRAMES

When the seedlings are large enough to handle, plant them out 2 in. square into frames. Always handle lettuces with great care to prevent bruising

VEGETABLES



LETTUCE  
All the Year Round



COS LETTUCE—Hardy Winter White



LETTUCE  
Winter Marvel



## WINTER CABBAGE LETTUCES

Lettuces that have to live through the winter need well-drained soil, and therefore do better on light, sandy, medium loams. Try to give the plot shelter from the north and east winds—if necessary put up strips of sacking 3 ft. high as a temporary hedge. Do not fork in compost or dung but sow the lettuces after a crop, such as second-early potatoes, which has been properly manured.

Normally the only preparation required is to rake the soil over when the previous crop has been harvested and, at the same time, to apply fish manure with a 10 per cent potash content at the rate of 3 oz. to the sq. yd. Meat and bone meal may be used instead at the same rate, in which case, add wood ash at 6 to 7 oz. to the sq. yd. Early in March the following year dried blood may be given at 5 oz. to the sq. yd.; be sure to apply it between the rows and not on the plants.

## SOWING

Sow the seeds in rows 1 ft. apart and not more than  $\frac{1}{4}$  in. deep early in September. Sow thinly but be prepared to thin out the plants to 5 in. apart before the winter sets in.

If the ground where they are to be grown is not ready, sow the seed about the middle of September in a sunny seed bed into which plenty of fine sedge peat has been raked. The rows here should be 9 in. apart and, if the seed is sown thinly enough, the seedlings can be planted out where they are to grow as late as the middle of November in the south and as early as the middle of October in the north.

## PLANTING

Lettuce seedlings can often be left in a seed bed until early the following March and still be planted out successfully. Make the rows 1 ft. apart and the plants 9 in. apart in the rows. Firm planting is

essential. Hoe  $\frac{1}{4}$  in. deep for the first three weeks after planting and then again as soon as the soil gets weedy—early in March, when dried blood can be applied. These lettuces will be ready in May.

## HARVESTING

Cut the lettuces as they are ready in May and June.

## RECOMMENDED WINTER CABBAGE VARIETIES

Arctic King, rather small, with solid hearts and few outside leaves. Very early and extremely hardy.

Imperial, large, hardy variety. Fine quality, medium hearts.

Tom Thumb, small compact, dark green hearts. Long standing. May be grown in the summer also. Good for small gardens.

Winter Crop, very hardy and suitable for the north. Solid hearts.

Winter Marvel, clear green, slightly wavy leaves. Hardy. Good in the east.

## COS LETTUCES

Cos lettuces are cultivated just as cabbage lettuces. Cos lettuces withstand droughts better than cabbage varieties. Some varieties, known as self-folding, heart moderately easily. With other varieties, it helps the lettuces to heart properly if a thick rubber band is put round each plant half-way down, a fortnight before it is to be cut. There are, of course, summer and winter varieties of cos lettuce.

## RECOMMENDED VARIETIES

*Summer Cos Lettuces*

Balloon, a very large, pale green and rather solid variety.

Harris White Select, a large, self-folding kind with solid, crisp, white hearts. Very popular.

Lobjoit's Green, has large dark green hearts, closely self-folded. Often lasts throughout the season.

Little Gem, a well-flavoured baby cos

with dwarf compact heads of medium colour. It has some cabbage lettuce characteristics.

*Winter Cos Lettuces*

Bath, has self-folding hearts, with dull brownish-green outer foliage.

Hardy Winter White, a very hardy, compact variety with large, crisp hearts. Long standing.

Winter Density, compact, very solid hearts, intermediate between cos and cabbage kinds.

## MARROWS

There are many different types and varieties of marrow: some dwarf, others almost climbers. Some marrows are largely used in summer and others are stored for use in winter.

### SOIL PREPARATION

Marrows prefer heavier soils, but they can be grown on most types of properly prepared ground. They do best in positions sheltered from cold winds when they are first put out in late May and early June. Marrows always need an abundance of water.

When preparing the ground, add well-rotted manure or compost where the plants are to grow at the rate of 2 bucketfuls to the yard run. It is useful to take out a drill about a spade's width and 9 in. deep and fill this with the manure or compost and firm down by treading. Put this soil back on top to form a ridge; the marrow plants can then be put out on this ridge, 6 ft. apart in the case of the trailing kinds and 4 ft. apart for the bush varieties.

The alternative is to dig holes 15 in. deep and 1½ ft. wide where the marrows are to grow, and to put into the bottom of each a layer of dung or rotted compost, 6 or 7 in. deep when trodden down. When the soil is put back to form mounds over the compost, add 3 or 4 oz. of fish manure.

### SOWING

It is best to sow three-year-old seed; the plants that result produce a greater proportion of female blooms than plants

from other seed. Sow the seeds where the plants are to grow about the middle of April, and cover them with upturned glass jam jars or a cloche.

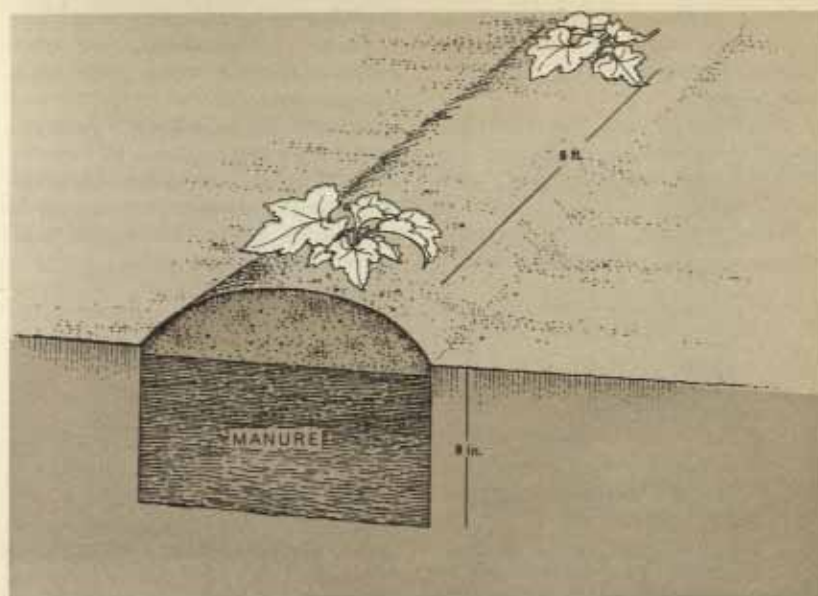
Alternatively, sow the seed in John Innes seed compost or Eclipse No-Soil compost in 3-in. pots in the greenhouse at a temperature of about 50° F. (10° C.). Harden off the plants by putting them into frames about the end of April. Plant them out where they are to grow about the third week in May. In the north, delay planting out until early June.

### PLANTING

If the plants were started in pots, water them two days before planting out. Make holes with a trowel at the centres of the mounds and plant firmly. Do not grip the plants by the stems or they may be bruised and irreparably damaged. It is as well to protect the plants during the first week they are in the ground by covering them, during the day-time only, with inverted 6-in. pots.

### GENERAL CARE

The tips of the main shoots on the trailing varieties should be pinched back by an inch when they are 1½ ft. long, for this encourages the formation of side growths (laterals) on which the bulk of the female flowers will be borne. It is a good idea to mulch the ground with well-rotted compost or damp sedge peat for 2 or 3 ft. round each plant. Lawn mowings to a depth of ½ in. round each plant help to



## PLANTING MARROWS

Draw a drill 9 in. deep, fill it with manure and firm down by treading. Make a ridge of soil on top of the manure and place the plants on this ridge

prevent the surface-feeding roots from drying out, which is vital. In dry weather, water for an hour once a week with an overhead rainer, or soak the surrounding soil with a watering-can.

This regular watering is important, but if too much leafy trailing growth results, clip back the shoots to allow more air to circulate round the flowers and developing fruits. If the plants are not growing in soil which is rich in compost, liquid manure can be given at the rate of a gallon canful at fortnightly intervals. There is little to be gained in encouraging too much growth.

Sometimes, especially early in the season, it is necessary to encourage pollination in order to get fruit to set. This can be done either by transferring pollen from the male to the female

flowers with a camel-hair brush or by picking off the male (non-fruiting) flowers and putting them on to the female (fruiting) ones so that the pollen is rubbed on to the stigma of the female flower. Female flowers can be identified easily by the swelling below or at the back of the bloom.

## HARVESTING

It is usually possible to start cutting marrows in July; keep cutting them when they are young and the plants will continue cropping until well on in September. If some large marrows are to be stored for the winter, leave the late fruits in position and cut them late in October.

## RECOMMENDED VARIETIES

Courgette, should be cut when they are not more than 6 in. long.



Roller, produces long white fruits without any ribbing. A heavy cropper, excellent for the north.

#### *Trailing Types*

Long Green Trailing, has cylindrical-shaped fruits, larger at the blossom end than the stem end. Dark green with lighter stripes.

Moore's Cream, smooth, creamy-skinned oval fruits of excellent texture.

#### *Bush Types*

Custard White, produces a creamy-white fruit with a scalloped edge at its concave base.

Green Bush, has dark green fruits with pale green stripes.

Tender and True, a prolific variety producing a flat type of marrow with no scallops. The skin is mottled green. Good flavour when cut young.

## MUSTARD AND CRESS

Though these salads are usually referred to as mustard and cress, it is more usual nowadays to grow rape and cress, because rape has more flavour.

#### SOIL PREPARATION

To avoid grittiness, grow these salads on damp sacking which can be laid on boxes in greenhouses or on the soil outside. Alternatively, sow on damp fine sedge peat. Where soil is used, water the bed with boiling water before sowing to kill the fungus spores of damping-off disease. This fungus trouble does not occur when sacking is used.

#### SOWING

Sow the mustard or rape seeds three days after the cress, so that the two crops will

mature at the same time. They will take from 10 to 14 days to mature. For even and speedy germination, keep the freshly sown seed in the dark by covering with further damp sacking or with upturned boxes until the seed has germinated. Make winter sowings in a greenhouse, spring sowings in a frame and summer sowings in the open. To sow 2 sq. yds. in the open, 1 lb. of mustard or rape seed is needed, or  $\frac{1}{4}$  lb. of cress seed.

#### HARVESTING

Cut the mustard and cress as they are needed, while they are still young and tender. If the salads are grown on soil, cut carefully with a pair of scissors and then wash well.

## ONIONS

Onions are thought to be a difficult crop to grow in Britain because the maggots of the onion fly attack the plants when they are only a quarter grown. However, the introduction of gamma dust has largely solved this problem.

There are three main groups of onions: salad or spring onions which are sown in the autumn or spring; the autumn-

sown varieties for early bulbs, and the early sown kinds for late-keeping and exhibition.

#### SOIL PREPARATION

Choose an open site so that the onions get plenty of sunlight. Good onions can be produced on varying types of soil but they do best on light, deep loam which has been well manured. If the land is

dug over in the autumn, even as early as mid-September, the soil has a chance to settle down; onions like a firm seed bed and the lighter soils can even be rolled before or after seed sowing. During the autumn digging, add well-rotted dung or compost at the rate of  $1\frac{1}{2}$  bucketfuls to the sq. yd. and, 14 days before sowing or planting out, apply a fish manure with a 10 per cent potash content at 4 oz. to the sq. yd. In the case of autumn-sown varieties lightly hoe in old soot at one handful per sq. yd. in February or give a dressing of 4 oz. of bone meal and 2 oz. of sulphate of potash at the same rate. In the north it may not be possible to hoe in the soot until March.

For autumn sowings, do not use dung or compost, but sow the seed on land which has recently grown a well-manured crop. Apply a fish fertilizer at 3 oz. to the sq. yd. If the ground has a low lime content add carbonate of lime as a top dressing at 5 oz. to the sq. yd.

#### SPRING SOWING

The seeds should be sown in March or as soon as the soil can be raked down to a fine tilth. Take out  $\frac{1}{2}$ -in.-deep drills 1 ft. apart and use  $\frac{1}{4}$  oz. of seed for each 50-ft. row. The seed is easier to sow thinly if it is whitened with lime. Parsley helps to keep away the onion fly, so it is a good idea to sow a row of this herb between every three rows of onions.

#### JANUARY SOWING FOR EXHIBITION

To grow large onions for show purposes, sow the seed in boxes containing John Innes seed compost early in January. Firm the compost level within  $\frac{1}{4}$  in. of the top of the boxes, whiten the seeds with lime and sow them, 1 in. square, on the surface of the soil. Press each seed into the soil with the point of a pencil and water through the fine rose of a can. Then place the boxes on the staging of the greenhouse with a temperature of

ONION  
Selected Ailsa Craig



65° F. (18° C.). Cover each box with a sheet of glass with a sheet of brown paper over the top; wipe the underside of the glass each day until the seedlings appear, when the glass and the paper may be taken off altogether.

At this time place the boxes on shelving near the greenhouse glass and three weeks later move them into a frame and harden off for about a fortnight. Plant



#### PLANTING ONIONS

Make holes with a small dibber and plant out the seedlings along a line; firm well to discourage onion fly

out the seedlings about the middle of April, 6 in. apart in rows 1 ft. apart.

To raise 3- or 4-lb. onions, grow each seedling in a 3-in. pot filled with John Innes potting compost No. 1. After the usual hardening off in the frame, knock the plants out of their pots and plant them, with balls of soil intact, 9 in. apart in rows 15 in. apart. Provide each plant with a bamboo stake so that the tops can be tied up. Water the plants in well.

#### ONION SETS

Onion sets are small bulbs which are planted in the spring as an alternative to growing from seed. Since they have a shorter growing season, it is often easier to grow and harvest from sets, especially in the north or wetter parts of the country. The plants are also less liable to attack by onion fly.

Sets can be bought or raised from seed. Sow seed thickly in May in fairly poor

ground. Do not thin, water occasionally but do not feed. In this way a crop of small bulbs will be produced, not more than  $\frac{1}{2}$  to  $\frac{3}{4}$  in. in diameter. Lift in September, store in a cool, dry place until planting time the following spring.

Plant out the single bulbs at the end of March in V-shaped drills 1 in. deep and 1 ft. apart. Push one bulb into the soil every 6 in. and hoe lightly to cover. If the bulbs tend to come up out of the soil within a week or so of planting, push them in firmly.

#### AUTUMN SOWING

Sow the seed in September in rows 9 in. apart. The thinnings pulled early in the following year are used as spring onions. The best varieties of onion for such spring use are White Lisbon and White Portugal, though other hardy varieties can be used for autumn sowing and harvested before the main-crop varieties in the late summer.

#### GENERAL CARE

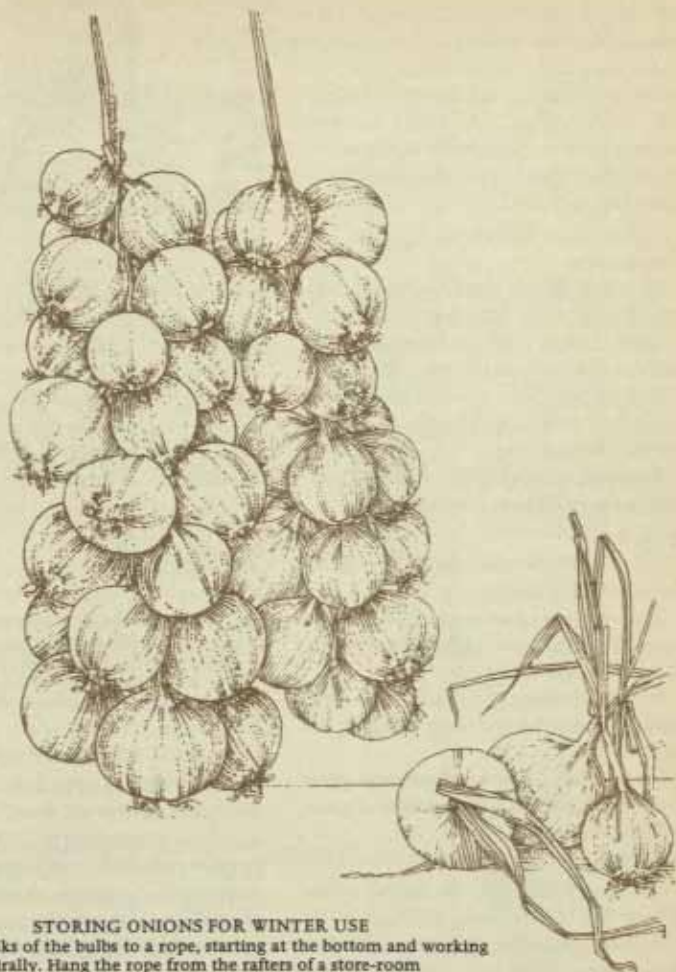
As main-crop bulbing onions will not survive mid-summer drought, supply artificial rain for about an hour every ten days if necessary. Do not give water when the bulbs start ripening in the late summer or early autumn.

Hoe the soil between the rows regularly and weed by hand in the rows. If the seed was sown very thinly and large bulbs are not required, there is no need for thinning, and therefore less likelihood of attack from onion fly. Where thinning is necessary, it should be done to within 4 in. apart.

#### ONION FLY

The best treatment is to dust the roots at thinning time (when the seedlings are in the "loop" or "crook" stage) with aldrin, a 4 per cent calomel powder or one of the up-to-date gamma B.H.C. dusts sold for the purpose. Follow this by a second application a fortnight later.





#### STORING ONIONS FOR WINTER USE

Tie the stalks of the bulbs to a rope, starting at the bottom and working spirally. Hang the rope from the rafters of a store-room

#### USING

Bulbing onions are ready for use in late August and September or early October. The autumn-sown kinds are harvested first. Bend over the necks of the plants by hand or with the back of the rake when the tops are starting to turn yellow. After this the leaves will gradually dry

off; when the skin of the bulbs turns yellow, plunge in a fork on either side of the row to loosen the soil. Carefully pull up the onions and lay them out in the sun so that they can dry off. Turn them over 14 days later so that they will ripen evenly; two weeks later they should be ready to put into store.

If the weather is bad, complete the ripening-off on shelves in the greenhouse or potting shed. Onions may be stored in boxes. So that the air will circulate round them, rest them on wire netting put into the bottom of the boxes. These boxes may be piled one on another in an airy, dry shed.

#### RECOMMENDED VARIETIES

##### *Autumn Sowing*

Autumn Triumph, globe-shaped, flattened, large bulbs. Excellent keeper.

Giant Zittau, medium-sized, semi-flat bulbs, brown skinned. Keeps well.

Red Tripoli, has red outer skin and is sometimes sold as Red Italian. The bulbs are flattish and long.

Reliance, semi-globular bulbs. Excellent keeper and heavy cropper.

##### *Spring Sowing*

A.I., semi-globular bulbs, mild in flavour. Good keeper.

Bedfordshire Champion, globe-shaped bulbs of good size. Light brown skin, firm and excellent flavour.

James's Keeping, medium size, firm flesh, reddish-brown skin shading to salmon-pink.

Up To Date, heavy cropper and good keeper. Uniform globular bulbs of good quality and weight.

##### *For Exhibition*

Crossling's Selected, the largest onion grown. Seed comes from Scotland.

Premier, a flattish, large bulb of pale straw colour. Very large and heavy. Buy a good strain.

Selected Ailsa Craig, pear-shaped large bulbs; dull, pale colour. As for Premier, strain is very important.



#### PREPARING ONIONS FOR HARVESTING

Bend over the necks of the plants when the tops begin to turn yellow, so that the leaves will gradually dry off.

#### PICKLING ONIONS

Pickling onions can be sown in poor soil. In April rake the soil level, sow the seed broadcast and rake again. Allow the bulbs to grow naturally, carrying out any hand weeding that may be necessary. Do not thin. When the tops start to turn yellow fork up the baby bulbs and leave them on the ground to ripen.

The two best varieties are Barletta, which produces early small white bulbs, and Paris Silver Skin, which produces early flat white bulbs.

## PARSNIPS

The great disadvantage of parsnips is that they occupy the ground for almost twelve months.

## SOIL PREPARATION

Parsnips will grow equally well in heavy clay or light loam. Use a plot that has been well manured for a previous crop. Never manure the ground especially for parsnips, or the roots will fork instead of growing straight and clean. Before sowing apply a complete organic fertilizer, such as a fish manure with a 10 per cent potash content, at the rate of 3 oz. to the sq. yd. Alternatively, apply a mixture of 2 parts bone meal and 1 part sulphate of potash at the rate of 3 oz. to each sq. yd.

## SOWING

The parsnip is the first vegetable to be sown each year—the end of February in the south and the end of March in the north. The seed may be sown in April, but the roots will not then grow so large.

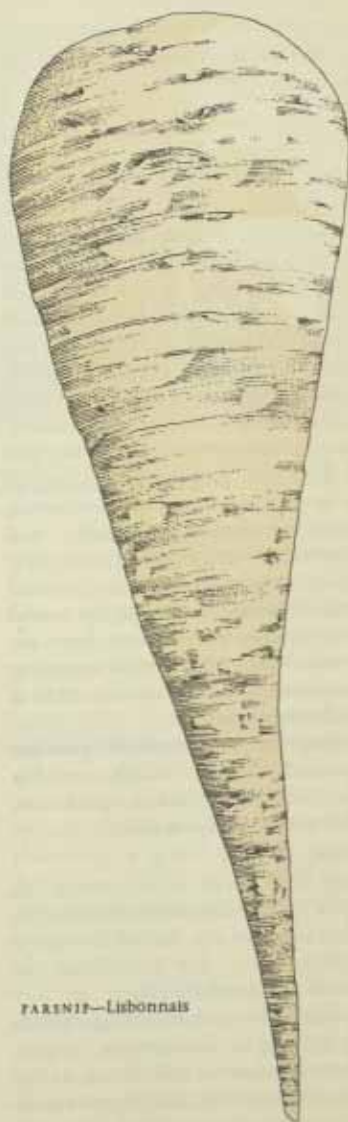
Make drills 1 in. deep and 15 in. apart and, because parsnip seed germinates badly, sow the seed thickly. If radish seed, which germinates quickly, is sown with the parsnip, it will mark out the rows and make it possible to hoe earlier.

## GENERAL CARE

When the plants are 2 in. high, thin them out to 6 in. apart. Seedlings may be transplanted to fill in gaps if plenty of water is given afterwards.

## HARVESTING

Parsnips taste best when they have been touched by frost and they may therefore be left in the ground until late in the winter. If the ground is needed for winter preparation, dig up the parsnip roots and, in the south, leave them on the ground in a heap, where the frost can touch and sweeten them and the rain can wash them.



PARSNIP—Lisbonnais



In the north, where frosts are harder and more prolonged, bring the roots indoors or into a dry shed and cover them with an old sack.

#### RECOMMENDED VARIETIES

Improved Hollow Crown, heavy cropper with long, smooth, well-shaped roots. Good quality.

Lisbonnais, handsome, tapering roots, fine skin and superior flesh. The epicure's variety.

Offenham, a heavy-shouldered, intermediate type. Best kind for shallow soils.

The Student, a heavy-cropping, medium-sized variety which has thick, tapering roots.

## PEAS

The green pea is now available in so many varieties that types can be chosen suitable for sowing at any time from February to November. Some varieties pod early and some late; a careful choice of seeds will maintain adequate supplies over several months. Choose early varieties for sowing in February and March, main-crop varieties for sowing in April and May, late varieties for sowing in June or even later, and winter-growing varieties for sowing in October and November. In milder districts the first early varieties can be picked in June, and the last of the late varieties in the second half of October, provided the frosts are not too sharp. The winter-growing varieties can be picked in early May of the following year.

There are two main groups of peas: the round-seeded kinds which are the hardier, and the wrinkled-seeded marrowfat which are the sweeter.

#### SOIL PREPARATION

At least four weeks before sowing, dig compost or well-rotted manure into the soil to a depth of 9 in. and at the rate of one bucketful to the yard along the length of the proposed row.

A week or two before sowing, rake in a top dressing of fish manure or meat and bone meal at the rate of 4 oz. to the sq. yd.; alternatively, rake in a mixture of 2 oz. superphosphate of lime and

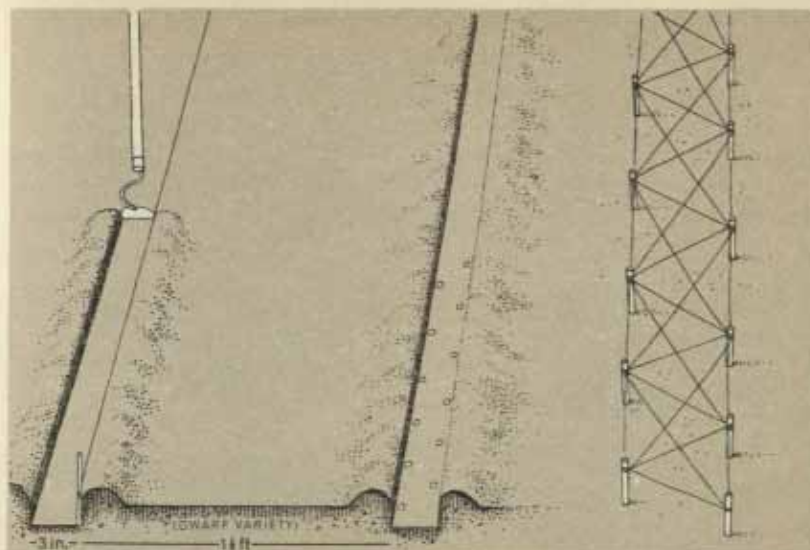
1 oz. sulphate of potash to the sq. yd.

#### SOWING

For early sowings choose a well-drained area, where the ground has been well prepared to provide aeration. Seeds sown in soil that is still wet and cold are sometimes attacked by a minute fungus which causes pre-emergence damping-off, so that germination appears to be poor. To guard against losses caused in this way, sprinkle organo-mercuric dust sparingly into the bag of peas, and shake the bag for a minute before sowing. This dressing will also prevent mice eating the seeds. Both these precautions are unnecessary for main-crop or late sowings.

Make 3-in. flat-bottomed drills with either a rake or hoe. The distance between the drills must vary with the fully grown height of the varieties to be sown. For 4-ft.-high varieties, leave 4 ft. between the drills; for dwarf 1½-ft. varieties, leave 1½ ft. between the drills, and so on. Scatter the winter-growing varieties along the drills, but set the main-crop and other varieties singly 2 to 3 in. apart, and staggered. To level up the surface, draw the soil over the drills with a rake, or, in very light soil, push it back over the drills with the feet.

To protect the seeds and seedlings from birds, place small twigs over the sowings, or black cotton stranded from sticks close to the ground. Alternatively, use



#### SOWING AND PROTECTING PEAS

Make 3-in., flat-bottomed drills with either a rake or hoe, and stagger the seeds along the drills 2 to 3 in. apart. To protect peas from birds, place small sticks at the side of the rows and twist black cotton among the sticks

bird-scarers, or pea protectors (wire frames made specially for the purpose and usable year after year).

#### GENERAL CARE

Once the seedlings are 3 in. high, push in small twiggy pea sticks along the rows to encourage the seedlings to climb. Later, push in close to the rows of peas, and along each side of them, taller pea sticks (about a foot longer than the ultimate height of the variety being grown) so that they slope outward from the row at an angle of 45°. This forms a "V" which provides the peas with more light and air to encourage ripening and to simplify picking. Alternatively, erect posts at each end of the rows and fix 3-in. square mesh wire netting to them, to run the length of the rows.

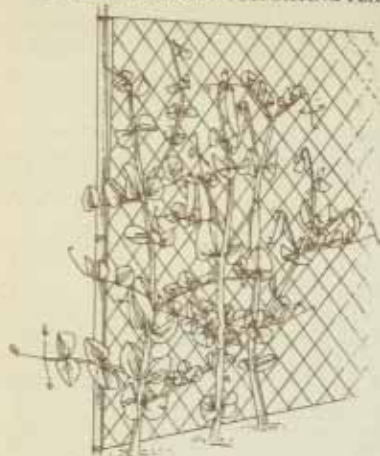
A constant supply of moisture must be available if good peas are to be grown, otherwise the pods become dry rather

than succulent, and growth is generally stunted. Mulching during the growing season is therefore vital. Use lawn-mowings, peat or leaf mould, or even polythene strips if no organic material is available. In dry weather this operation is particularly important, because peas suffering from drought are prone to mildew attack. This appears as a slight powdering of the leaves and pods and spreads rapidly, stunting the pods and preventing a good crop. To produce succulent, quickly grown plants, the plants need watering every week during a dry summer.

#### HARVESTING

Pick the pods regularly when ready, taking care to remove all the pods before they mature; if one or two ripe pods are left on the plants for seeds, the quantity of the crop will be reduced. It is better to grow a few plants separately for

## TWO METHODS OF SUPPORTING PEAS



Erect posts at each end of the row and fix 3-in. mesh wire netting firmly to them for the peas to climb. After harvesting remove the haulms from the netting



To give the peas more light and air, push in pea sticks along each side of the row sloping outward forming a V. The peas will then grow away from each other

seed-saving. Immediately the plants are completely cleared of pods, remove the haulms and put them on the compost heap. If they are left standing and show any signs of mildew, they become a certain source of infection to later varieties.

Leave the roots in the soil, as they will provide it with nitrogenous material.

## RECOMMENDED VARIETIES

*First earlies* for sowing in February and the first half of March, and taking about 11 or 12 weeks to mature.

Feltham First, 1½ ft., the earliest variety of all.

Kelvedon Wonder, 1½ ft., a heavy cropper.

Meteor, 1½ ft., a good early, round-seeded variety.

*Second earlies* for sowing in March and taking about 12 or 13 weeks to mature.

Duplex, 2½ ft., pods hang in pairs.

Early Onward, 2 ft., like Onward but a week or two earlier. Well-filled, blunt-ended pods.

Onward, 2½ ft., a remarkable cropper.

(The foregoing varieties are recommended for deep-freezing.)

*Main crop* for sowing in April and May and taking about 13 or 14 weeks to mature.

Kelvedon Monarch, 2½ ft., a wrinkled-seeded, heavy cropper.

Raynes Park, 3 ft., delicious, heavy-cropping; dark green leaves.

Stratagem, 2 ft., produces large pods.

*Edible-podded or Sugar Peas*

Dwarf Sugar, 2 ft., excellent flavour.

Giant Sugar, 5 ft., also called *Pois Mangetout*

(Two good varieties which can be used whole when young. Both are main-crop types and take about 12 weeks to mature.)

*Lates* for sowing in June or later in favourable seasons, and taking up to 15 weeks to mature.

Alderman, 5 ft., produces very dark green pods.

Gladstone, 4 ft., a good later variety because it withstands drought better than any other variety of pea.



*Winter-growers*

Round-seeded varieties for sowing in October or November in a sheltered spot, such as a sunny border at the foot of a fence; must be protected with straw or

bracken during really severe weather. Sow the seed thickly, as winter losses are inevitably heavy.

Feltham First, 1½ ft., reliable.

Meteor, similar to Feltham First.

## ASPARAGUS PEAS

The plants of this vegetable look more like field vetch than garden peas. They grow as 1½-ft. high bushes and produce beautiful bright red-brown blossoms, like baby sweet peas.

### SOIL PREPARATION

The asparagus pea will grow on almost any soil but prospers best if well-rotted compost is dug into the ground a spade's depth along the strip where the seeds are to be sown.

After digging, tread the ground well to make it firm, and follow this by raking to a fine and level surface. During this operation apply fish manure with a 6 per cent potash content at 3 oz. to the sq. yd. Unless the soil is chalky, lime the surface

afterwards with carbonate of lime at 6 oz. to the sq. yd.

### SOWING

Take out drills ½ in. deep with the corner of the draw hoe drawn against a line stretched tightly over the soil. Drop one seed every 4 in. along the drill, rake the ground over and firm with the rake head.

### GENERAL CARE

Though the peas do not climb, put twiggy sticks 1 ft. high on either side of the rows to support the plants.

### HARVESTING

The pods are square with green, fleshy flanges. Pick them while they are young (when they are less than 1 in. long).

## POTATOES

The potato is useful as a cleaning crop; the rows are earthed up and the tops grow large so that weeds are smothered, and the ground is cleaner at the end of the season because of all the work that has been done. To get good yields, manure the crop heavily. This also leaves the ground in a better condition for the crop that follows.

### SOIL PREPARATION

Dig the ground in the autumn to a spade's depth and leave it rough. In the spring—late in March or early in April—prepare 4-in.-deep furrows and place in them old

dung or well-rotted compost at the rate of one bucketful per yard run. Then sprinkle evenly along the furrows a fish fertilizer with a 6 per cent potash content at 3 oz. to the yard run. Do not give lime; potatoes dislike it and its presence in the soil seems to encourage scab disease.

### PREPARING TUBERS

Plant seed potatoes the size of a hen's egg, weighing about 2½ oz. The best tubers are obtained from Scotland or Ireland with the appropriate certificate to show that they are free from virus. If the tubers are larger than 2½ oz. cut them

in two, lengthways, at planting time, but be sure that there is a shoot on each piece.

It pays to "chit" potatoes—to make them shoot sprouts before planting. At the end of January or in February place them with the rose ends—the ends with the majority of eyes—upward in a tray. If the tubers are put tightly together in the tray they will keep one another upright. At each corner of each tray, which should be about 2½ ft. long, 1½ ft. wide and 3 in. deep, nail a 1-in.-square piece of wood to stand at least 3 in. above the box. The trays may then be piled one on the other without injuring the tubers or the sprouts they are going to produce.

Store the trays in a frost-free shed, greenhouse or room where there is plenty of light. If greenfly attack the sprouts that appear (it may happen when they are about ½ in. long), dust the tubers all over with derris dust. If more than two good shoots develop on each tuber, rub off the extra ones carefully with the thumb.

#### PLANTING

In the south, plant potatoes about the middle of March; in the colder parts of the north, about the middle of April. Because the main crops need a longer season of growth, plant them first, and the earlier crops last. At planting time the two sprouts on each tuber should be about 2 in. long. To ensure that the shoots are not knocked off the tubers, take the potatoes out of the trays one at a time to put them in the furrows where they are to grow.

Plant earlies 1 ft. apart in rows 1½ ft. apart; second earlies 1½ ft. apart in rows 2½ ft. apart; main-crops or lates 1½ ft. apart in rows 2½ ft. apart.

Place the potatoes on the manure in the furrows and cover each one with a small handful of grass mowings, to keep away scab disease. Use the draw hoe to draw soil into the furrows in such a way

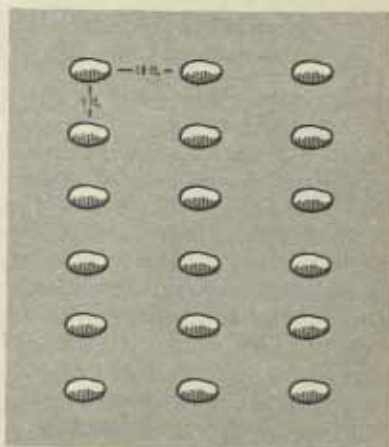
that a mound is left right the way down each row. When the tops come through these mounds it may be necessary to use the hoe again to cover the leaves until all fear of frost is passed.

#### GENERAL CARE

At the beginning of June carefully hoe away a little of the soil to expose the leaves. When the plants are 8 in. high, hoe again to earth up the plants, leaving the top 6 in. uncovered. The sides of the ridges should be at an angle of 45°. If they are steeper, tubers may appear through the sides of the ridges; if they are flatter, the plants will not be sufficiently well covered.

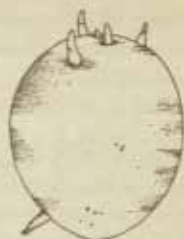
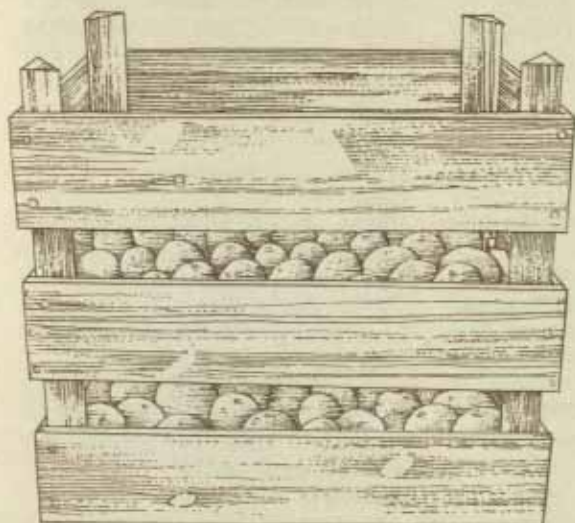
Make a second earthing up a month later and another three weeks after that. On these occasions, draw up only another inch of soil.

Potato blight disease invariably attacks the leaves. It usually starts some time in June in the south and as late as the first week of July in the Midlands and perhaps about the third or fourth week of July in the north. Spray or dust the



Planting distances for early potatoes

## VEGETABLES

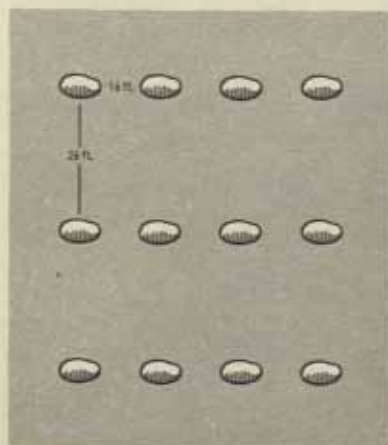


At planting time, if the tubers are larger than  $3\frac{1}{2}$  oz., halve them lengthways (below), making sure that there is a shoot on each half

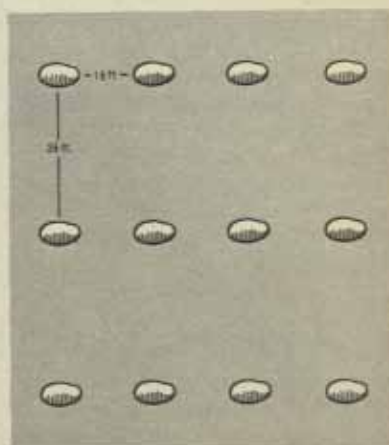


### PREPARING TUBERS

To encourage the tubers to sprout before planting, place them in trays, rose ends upward, and stack the trays on top of one another in a light, frost-free shed



Planting distances for second earlys



Planting distances for main-crop potatoes



## VEGETABLES

plants with a copper mixture as a preventive, covering the leaves thoroughly.

### HARVESTING

Use the early potatoes as soon as they are large enough, but do not be tempted to dig them all up when they are small; a crop can double its weight in a fortnight. Do not plunge the fork straight into the ground—it may impale some of the potatoes—but fork on the side, to throw the plants forward. Special flat-tined potato forks are available.

It is worth while cutting off the tops of the main crop with a pair of shears and removing them to the compost heap before attempting to dig up the potatoes. There is then no fear that the spores of any disease on the leaves will drop down on to the potatoes and so cause trouble when they are stored.

### STORING

Potatoes can be stored in clamps: dig a shallow trench 4 ft. wide, and pile the potatoes carefully to a height of 3 ft. Cover the mound with a 6-in.-thick layer of straw, and then a 6-in. layer of soil.

When digging out the soil for this purpose, make a trench all round the clamp to carry away the excess moisture. It is important to make an air-shaft into the mound; tightly twist a 4-in. thick tuft of straw and pass it through the covering soil. A long clamp needs such twists of straw at 6-ft. intervals.

### RECOMMENDED VARIETIES

#### *Earlies*

Arran Pilot, a white kidney-shaped potato which can be dug early or left in the ground to become a second early.

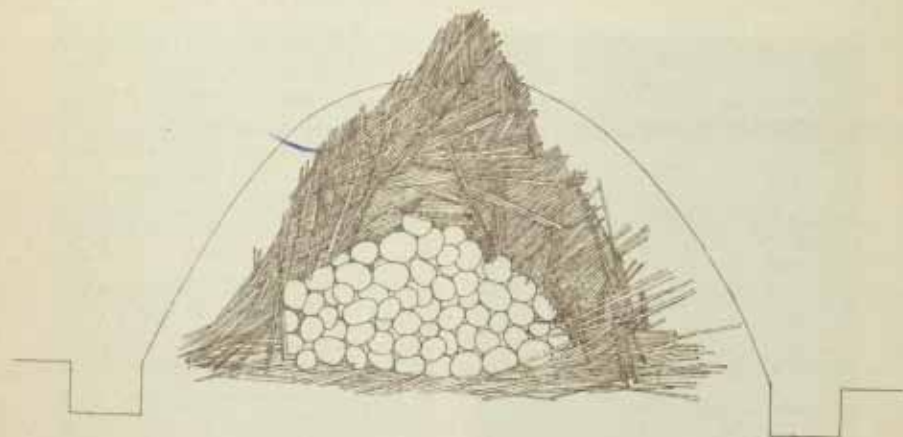
Home Guard, much grown because it is resistant to wart disease. A heavy-cropping, oval-shaped tuber.

Ulster Prince, the earliest maturing variety in this section. Produces large, well-shaped tubers with shallow eyes. Resistant to wart disease.

#### *Second Earlies*

Ben Lomond, tubers are of a soapy as distinct from floury texture; oval and of a good shape.

Craig's Royal, tubers slightly soapy. A very heavy cropper.



A POTATO CLAMP

Dig a 4-ft. wide, shallow trench and pile the potatoes in the trench to a height of 3 ft. Cover them with a 6-in. thick layer of straw followed by a 6-in. layer of packed soil, and allow a twist of straw to pass through the top of the clamp to ventilate it

Dunbar Rover, produces floury tubers of good quality and size.

Olympic, a delicious variety. The tops are sturdy and short and the flowers are mauve.

#### *Main-crop*

Arran Banner, flattish large tubers. Good quality and very heavy cropper.

Arran Consul, excellent for poor land. Tops sparse and open, longish tubers.

Arran Victory, perhaps the latest-keeping variety. Round tubers, purple in colour.

Dr. McIntosh, a white, floury, kidney potato. Resists potato blight.

Kerr's Pink, a good northern variety. Likes heavy soils and a high rainfall.

King Edward VII, a very popular potato, but not a heavy cropper, unless the

soil is loamy and peaty. Smooth white skin with pink splashes.

Majestic, an enormous cropper, large kidney-shaped tubers, but rather soapy.

### SALAD POTATOES

Some special varieties of potatoes are grown for salad. They have waxy flesh and a nutty flavour and must always be served cold after cooking.

The Congo, a purple, black-fleshed variety of excellent flavour.

Fir Apple, a pink-skinned potato with lemon-coloured flesh.

The tubers of both these varieties should be planted early in May 1 ft. apart in rows 1½ ft. apart. Lift the crop in October and store in boxes of sand in a frost-proof shed.

## RADISHES

There are two main types of radish: the large winter kind and the small varieties that are grown for use in salads.

#### SOIL PREPARATION

Radishes do not need deep soil for they are not in the ground long; but they require plenty of fine organic matter in the top 3 or 4 in. so that they can grow quickly and never be short of moisture. Prepare the plot by forking in well-rotted compost at the rate of a bucketful to the yard run, or damp sedge peat at a similar rate. In addition, give fish manure at 2 oz. to the sq. yd.

#### SOWING

Before sowing the seed, see that the surface of the soil is not lumpy; treading and raking may be necessary to make the surface level and fine. Sow the first seeds in a sunny, sheltered spot in February in the south and in late March in the north. Cover the ground with straw after this

first sowing, and remove after germination. From this time on it should be possible to make successional sowings every three weeks until late August.

The seed may either be sown in drills ½ in. deep or broadcast. So that all the roots may be eaten while they are fresh and tender, do not sow more than one 8-ft. row at a time, or a patch bigger than half a sq. yd. Sow thinly because it is not worth while thinning out the roots. Although sowing should be shallow, pat down the soil with the back of a spade after the seeds are covered to make it really firm.

#### GENERAL CARE

Do not allow radishes to suffer from lack of moisture. In dry summers use a square-area rainer to provide overhead irrigation for half an hour at least once a week. Radishes should be grown quickly or the roots will become coarse and fibrous.

## VEGETABLES

### HARVESTING

Pull as many roots as are needed when they are young and tender. Any plants that are not required should be thrown on the compost heap. If mixed seed is grown it is possible to have a variety of whites and reds, as well as longs and shorts and certain kinds that are red and white.

### RECOMMENDED VARIETIES

#### *Rounds*

*Sana*, small scarlet roots. Good in the north.

*Sparkler 50/50*, the top half is scarlet and the bottom ivory.

*Turnip Red*, bright red skin with tender, crisp, white roots.

#### *Longs*

*Icicle*, a pure white long variety. Good flavour.

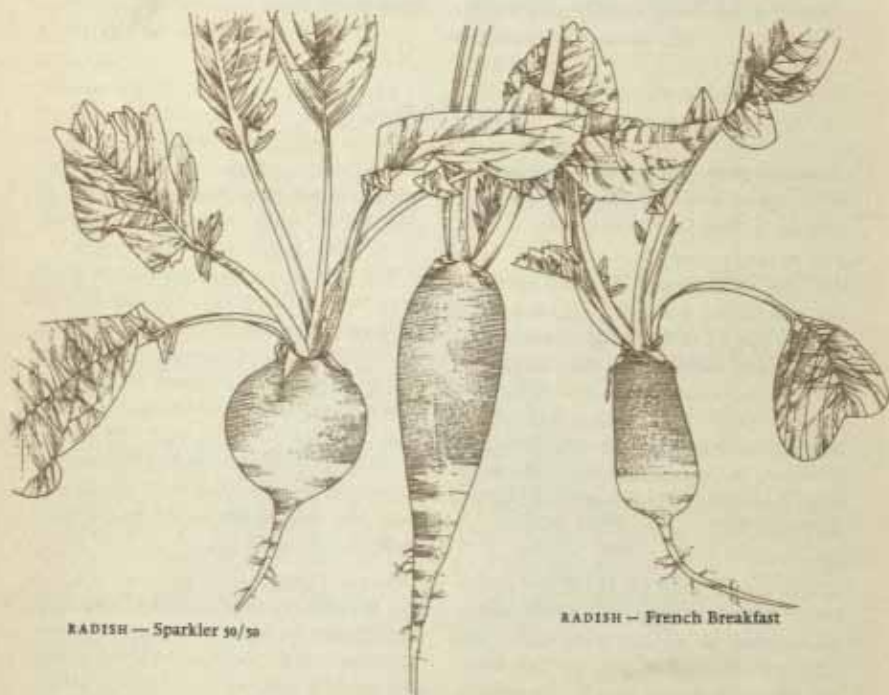
*Wood's Early Frame*, an early long scarlet.

#### *Ovals*

*French Breakfast*, a deep crimson with delicious white flesh. Roots solid, sweet and oval.

### WINTER RADISHES

These make a good vegetable served hot in the winter. Sow the seeds in drills 1 in. deep and 9 in. apart in mid-July in the north and mid-August in the south. Thin to one plant every 6 in. a month later. Dust with B.H.C. or lindane to





keep down flea beetle for the first three weeks after seedlings appear. Hoe regularly to keep down weeds. Harvest in the winter.

#### RECOMMENDED VARIETIES

Black Spanish Long, rather like long

beets. The skin is black and the flesh inside pure white. Strongly flavoured.

Black Spanish Round, round, black-skinned roots the size of small turnips.

China Rose, an oval pink variety; roots the size of round beet, with white flesh.

## RHUBARB

Although rhubarb is used as a fruit, it is grown in the vegetable garden. The crop is a permanent one and should be planted in a corner on its own. Planting the right varieties will ensure supplies of rhubarb from February until mid-summer.

#### SOIL PREPARATION

Rhubarb will grow in almost any soil but does best on a heavy loam. The ground requires manuring heavily a few weeks before planting; dig in to at least a spade's depth well-rotted animal manure at the rate of 2 bucketfuls to the sq. yd.

#### PLANTING

Although seed can be sown in a frame in March it is rarely successful. Instead, plant "crowns"—thick roots with one or two large, round buds at the top. In March, make holes with a spade, 3 ft. apart with 4 ft. between the rows, so that roots can be well buried. Only the crowns or thick round buds should be left above the soil. Tread well after planting, to make certain that the roots are completely in contact with the soil. After planting, cover the bed with straw 1 ft. deep if possible, and over it apply a fish fertilizer at 3 oz. to the sq. yd. between the rows.

#### GENERAL CARE

Every December add more straw to the bed to keep the depth at 1 ft. Every May and September apply more fish manure at 3 oz. to the sq. yd. No other work is necessary as the straw smothers the weeds; and because of the straw, the

rhubarb can be pulled very early and its flavour is excellent.

If any flowering stems should appear cut them down immediately.

Lift and divide some of the plants after five years.

#### USING

Do not pull any stems the first year; after that use rhubarb as needed. Timperley Early can be pulled in February if it has been grown under straw. Hawke's Champagne will usually start in March and The Sutton in April. The latter will go on until well into the summer. Stop pulling about the middle of August to allow the plants to build up big crowns for the following year.

Do not over-pull any plant or it will starve; leave four or five good stems in position. The leaves on these stems will manufacture elaborated sap, and this will help to produce more roots and more stems and leaves.

#### RECOMMENDED VARIETIES

Hawke's Champagne, perhaps the most appetizing variety of all. Very red stems; most attractive.

The Sutton, the largest of these three varieties, has the great advantage that it never goes to seed. It is therefore much grown in the drier areas of the east of England.

Timperley Early, a very early variety and a good choice for forcing. The stems are thin but delicious.

## SALSIFY

Salsify is a root crop with an unusual texture and flavour.

## SOIL PREPARATION

As with most root crops, salsify does best on light loam, but it will grow on most soils. Do not dig fresh dung or compost into the soil, but sow the seeds in soil that was well manured the previous year. Lightly rake in fish manure at 4 oz. to the sq. yd. when preparing the strip of ground early in April, or give a complete fertilizer at 4 oz. to the sq. yd.

## SOWING

Sow the seed thinly about the middle of April in 1-in.-deep drills scratched out with the corner of a draw hoe held against a marking line. If more than one drill is needed, allow 1 ft. between them. To save seed it is possible to sow at stations 8 in. apart along the drills, three seeds to a station, and then to thin out to one

plant per station later. If the seed is sown thinly in continuous lines, thin to 8 in. apart when the plants are 1 in. high.

## GENERAL CARE

Hoe lightly between the rows, tending to draw the soil up to the plants rather than away from them. Water in dry periods.

## HARVESTING

The roots may be dug up for use or storing from the third week of October onward. The roots are hardy enough to be left in the ground all through the winter until they are needed. Great care must be taken in lifting, because the roots bleed badly if they are damaged. If the roots are left in the ground in winter, tender shoots called chards can be taken in March or April and used green or blanched.

The most popular variety is Sandwich Island, which is used in salads.

## SEAKALE

Seakale has to be forced before it can be eaten. Its shoots look rather like small rhubarb crowns with similar leaves. The blanched leaf-stalks should be used while young and tender.

## SOIL PREPARATION

Seakale grows best in a sandy loam which has been well dug and manured and which has a fairly high lime content. Dig the soil over in October or November, burying fully decomposed animal manure or rotted compost at the rate of one large barrowful to 8 sq. yds. Leave the ground rough for frosts and cold winds to work on. About mid-March fork the soil over lightly, adding fish manure with

a 10 per cent potash content at 4 oz. to the sq. yd. If the soil is not already limy, give a dressing of carbonate of lime.

## SOWING

Although it is possible to raise plants from seed sown in March and April in drills 1 in. deep and 1 ft. apart, thinning the seedlings later to 6 in. apart, it takes two or even three years before the crowns are strong enough to use for forcing. It is usual, therefore, to buy "thongs", or prepared root cuttings.

## PLANTING

Plant the thongs 1 ft. apart in rows 1½ ft. apart. Make a hole with the dibber so that when the thong is dropped into the

hole the top will be 1 in. below the surface of the ground. Firm well afterwards.

#### GENERAL CARE

Hoe lightly among the plants in the summer and cut off any flower heads as soon as they appear. During the third week of October cut the foliage down to soil level if it has not already died down.

#### FORCING

In November lift the roots for forcing, and cut off the side roots which are the thickness of a pencil.

Pot up four or five of the main roots in an 8-in. pot, or more roots in a large deep box. Put the potted-up roots in the dark in a temperature of 55° F. (13° C.). Underneath the greenhouse staging is suitable for this purpose if sacking is nailed to the staging to hang down and so keep out the light. Alternatively, a cupboard near the kitchen stove will do.

When the pure white stems of the forced seakale are about 8 or 9 in. long—usually after six or seven weeks—they may be cut. After forcing, the roots are of no further use. Cut them up and throw them on the compost heap.

It is possible to force seakale in the open by earthing up the soil over the plants to a depth of 9 in. This cannot be done

until the late autumn, and only when the soil is friable and dry. In a warm, sandy loam, seakale will grow up through the ridges thus formed. It is impossible to force seakale in this way in heavy soil.

Cut the heads at the base with a small strip of root attached to prevent drying out. Then when all the seakale has been forced or cut, pull down the earthed ridges with a draw hoe and allow the plants to grow naturally in the sun to ensure good growth.

#### PROPAGATION

Propagation is by root cuttings. Cut off straight, 6-in. long side growths, called thongs, from the established roots in November. Trim the thongs, making the tops square and the bottoms slanting so as to remember which is the right way up. Tie them into bunches of a dozen, stand them upright in the lee of a greenhouse and cover them with soil or fine ashes 1 ft. deep. By the early part of the following March the top of each thong will have developed a number of buds. Leave only one or two buds on each thong that is to be planted.

#### RECOMMENDED VARIETY

Lily White, pure white when forced. Highly flavoured and a heavy cropper.

## SHALLOTS

Shallots are one of the first vegetables to be planted each year and one of the easiest to grow. The bulbs are grown almost entirely for pickling but they can be used also as a substitute for onions. They have a milder flavour than onions and have the advantage that they keep very well.

#### SOIL PREPARATION

Where the ground has been manured for a previous crop it is only necessary to

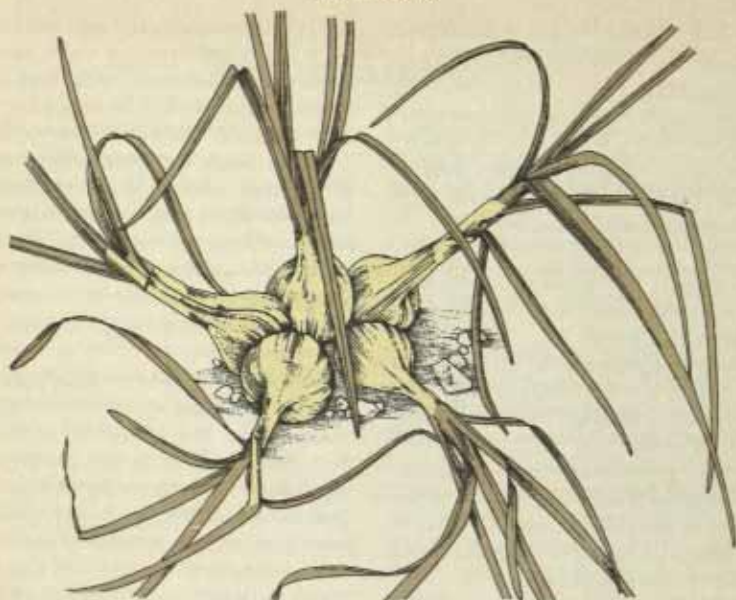
fork it over. If the soil is poor, lightly rake in half a bucketful of well-rotted compost or sedge peat per sq. yd. Afterwards tread the ground evenly to firm it.

#### PLANTING

Shallots can be raised from seed, but this is not the usual practice as they bolt easily. Sets of bulbs for planting out are obtainable by weight (12 or 13 to the lb.).

Choose an open, sunny position, on high ground if possible as good drainage





SHALLOT—Common Shallot

is an advantage when planting while the soil is still cold.

Plant bulbs as early as possible in February in the south and late in March in the north. Allow 6 in. between bulbs and 1 ft. between rows. Push the bulbs into the ground so that they are half buried. Two or three days after planting check that worms have not pushed the bulbs out; if the bulbs are loose firm them down again.

#### GENERAL CARE

Hoe lightly between the rows to keep down weeds. About the third week of June, if the weather has been dry, give the plants a feed of Liquinure or Bio Humus, at the rate of up to a pint per plant after dilution according to the manufacturer's instructions.

#### HARVESTING

Fourteen days after the leaves start to turn yellow, the clusters of bulbs which will have developed should be lifted by inserting a fork underneath the clusters and pressing the handle down carefully; leave the bulbs on the surface of the soil. A week later put the clusters of bulbs on a path or the tin roof of a shed to continue ripening and turn them slightly every day. After a week of this treatment divide the clusters into separate bulbs. They can then be stored or used.

#### RECOMMENDED VARIETIES

Common Shallot, small, brown English variety.

Russian Shallot, a much larger bulb. Reddish-purple in colour.

## SPINACH

There are two main types of annual spinach: round or summer spinach and prickly or winter spinach.

## SOIL PREPARATION

A well-worked soil, rich in organic matter and therefore retentive of moisture, is good for spinach, and for winter spinach light soil is most suitable. The plants go to seed quickly on poor soil and dislike sandy soil because there is no reserve of moisture. As spinach grows quickly if well fed, it is often used as an inter-crop between peas or beans, or as a catch crop before planting out brassicas or leeks.

When forking over the ground, dig in fully rotted dung or compost at the rate of a bucketful to the sq. yd. After treading the ground over to firm it and break down the lumps, apply a fish manure at 4 oz. to the sq. yd., raking it in lightly when the surface is being levelled and a tilth prepared. A mixed fertilizer of bone meal, hoof and horn and sulphate of potash in the proportions of 4:2:1 can be used instead at the rate of 4 oz. to the sq. yd.

## SOWING: SUMMER SPINACH

Sow summer spinach seed in early March in the south and late in March in the north, choosing a well-sheltered position. Make three successional sowings at 14-day intervals. Take out drills 1 in. deep and 1 ft. apart with the corner of a draw hoe and sow the seed very thinly in these drills. Three weeks later thin the seedlings to 6 in. apart. If the plants are first thinned to 3 in. apart and thinned again three weeks later, the second thinnings may be cooked and eaten whole.

## GENERAL CARE

Do everything possible to grow the crop quickly. A  $\frac{1}{4}$ -in.-thick layer of lawn mowings on either side of the rows for a width of 6 in. will help, but do not put

the mowings on deeper or they will heat up and damage the plants. Water and hoe regularly and feed with liquid manure. Top dress the rows with nitrate of soda at the rate of  $\frac{1}{2}$  oz. to the yard.

## SOWING: WINTER SPINACH

Sow the winter spinach seed during the second week of August, and make successional sowings every 14 days until about the third week of September. Choose a shadier position than for spring sowing and soak the seed in a cup of water the day before sowing. If the soil is heavy clay it is advisable to prepare a raised bed 3 ft. wide: dig the soil out 3 in. deep to a spade's width on either side of the bed and throw this evenly on top. Such a raised bed keeps drier in the winter and allows excess rain to drain away. Winter spinach needs some protection from mid-November onward, either by putting bracken or straw between the rows or by covering the plants with cloches.

## HARVESTING

Always pick summer spinach when the leaves are young and tender; it is possible to remove most leaves from the plants leaving only a few in position to continue the growth. When harvesting winter spinach, however, pull only the largest leaves, and then only a few leaves, of each specimen. At the end of the winter the plants will die.

## RECOMMENDED VARIETIES

*Summer*

Goliath, large leaves of dark green. Gives heavier yield than most strains.

Monstrous Viroflay, a large, round-leaved variety. Mid-green. Apt to go to seed.

Reliance, very large, thick leaves, dark green in colour.

Victoria Long Standing, dark green leaves. Slow to go to seed.

#### Winter

Long-standing Prickly, a hardy, large-leaved plant. It stands a long time before running to seed.

Perpetual, gives supplies throughout autumn and winter when ordinary spinach is not available.

### SPINACH BEET

Spinach beet is a leaf crop which stands well throughout the winter, and yields for many months. It is also known as edible-leaved beet or perpetual spinach. The flavour is very similar to that of the annual spinach.

#### SOIL PREPARATION

Spinach beet will grow satisfactorily in most soils.

Dig in rotted compost at the rate of a bucketful to the yard run well before sowing time, or sow on land that was well manured for a previous crop.

#### SOWING

To have a supply of perpetual spinach all through the year, make one sowing during the middle of April and a second sowing about the middle of August. Take out drills 1 in. deep and 15 in. apart and sow the seed thinly.

When the plants come up, thin the seedlings out to 8 in. apart in the rows. If any gaps appear, transplant some of the seedlings.

#### GENERAL CARE

Hoe lightly with a Dutch hoe to keep down weeds, and if August and early September are very dry, see that the second sowing is well watered.

#### HARVESTING

Pick the leaves when they are a usable size, together with the stems. Do not leave the foliage to grow old and over-large or the crop will be reduced. Even when leaves are not required for the

house, pick them and put them on the compost heap; the yield will continue because new leaves will grow in place of the old ones. Allow the autumn-sown plants to build themselves up well before a hard winter sets in, by picking fewer leaves from them.

#### RECOMMENDED VARIETIES

Lucullus, produces pale yellowish-green leaves, large and closely curled.

Perpetual, an excellent substitute for annual spinach.

### NEW ZEALAND SPINACH

This plant has thick leaves that creep along the ground rather like decorative ivy. As it comes from islands in Australasia it does not mind hot, dry weather. It does not bolt like true spinach.

#### SOIL PREPARATION

As for annual spinach.

#### SOWING

Sow the seed in John Innes seed compost in boxes or pots late in March, in a greenhouse or frame. When the seedlings come through put the pots or boxes on shelving near the glass.

At the beginning of May put the plants out in a frame to harden off before they are planted outside.

If a greenhouse is not available, sow the seed in the open about the third week in May, putting two or three seeds in clusters 2 ft. apart and covering the seeds with upturned glass jam jars. Thin down to one per station when the seedlings are tall enough.

#### PLANTING

Plant out at the end of May 2 ft. apart in rows 3 ft. apart.

#### GENERAL CARE

The plants soon spread over the ground taking up their allotted space and providing their own mulch. Watering may be needed in dry spells and weeds should be kept down.



## HARVESTING

When the stems are about 1 ft. long, pinch out the growing tips. This will encourage the plants to produce more shoots. As the plants get larger keep

pinching back the stems by about an inch and pick the leaves off as they are wanted.

The tips that are pinched out are quite delicious when cooked.

## SQUASHES

The squash is a kind of firm-fleshed vegetable marrow, and its name derives from the Red Indian word *ashutasquash*. The fruits of summer squashes are used as they are ready in the summer, while the fruits of winter squashes are allowed to grow until they are their full size, when they are stored in a dry, frost-proof shed for use as required.

There are two types of squash—bush and trailers.

The plants are grown in exactly the same way as vegetable marrows.

## RECOMMENDED VARIETIES

*Summer*

Golden Summer Crookneck, a bush type, producing orange fruits.

Noodle, a trailing type. Pick the fruits when 8 in. long.

Prolific Straight Neck, a bush type, with creamy-yellow fruits.

*Winter*

Banana, has grey-green fruits with flesh of banana texture, orange in colour.

Hubbard, a trailer with huge fruits which store well.

## SWEDES

Swedes are a hardy winter root vegetable. They have a higher sugar content than turnips, take a longer time to mature, and when they are harvested they are larger and keep better.

## SOIL PREPARATION

Swedes will grow on most soils provided they are well cultivated. If possible, sow on land which has been well manured for the previous crop; no manure or compost should be given to the soil for this root crop. On the other hand if the ground is not already alkaline it should be limed because swedes are liable to club root disease. After forking over the soil lightly and treading the ground firm, lightly rake in a fish manure or a complete fertilizer at 3 oz. to the sq. yd. Afterwards, if the soil is not limy, give

carbonate of lime at 6 oz. to the sq. yd. as a top dressing.

## SOWING

Sow the seed thinly in drills 1 in. deep and 1½ ft. apart. Thin to 10 in. or 1 ft. apart when the seedlings are 1 in. high. Sow early in May in the north and late in May or early June in the south.

## GENERAL CARE

Hoe regularly between the rows and use B.H.C. dust, D.D.T. or lindane to prevent attacks by turnip flea beetle.

## HARVESTING

Swedes are so hardy that they can be left in the ground in the winter. If it is likely that the soil may freeze so hard that it is impossible to lift the roots, dig some up and store them in boxes in a shed or in a clamp in the same way as potatoes.

RECOMMENDED VARIETIES

It is better to buy seed of either the purple top or the bronze top kinds.

*Purple Top*

Kelvedon Advanced, globe-shaped; free from neck, good quality, suits north or south.

Tipperary, rosy purple globe. Good, heavy cropper.

*Bronze Top*

Lord Derby, elongated globe. Good keeper and heavy cropper.

Ne Plus Ultra, a round root with dwarf foliage. Good keeper. Suitable for small gardens.

## SWEET CORN

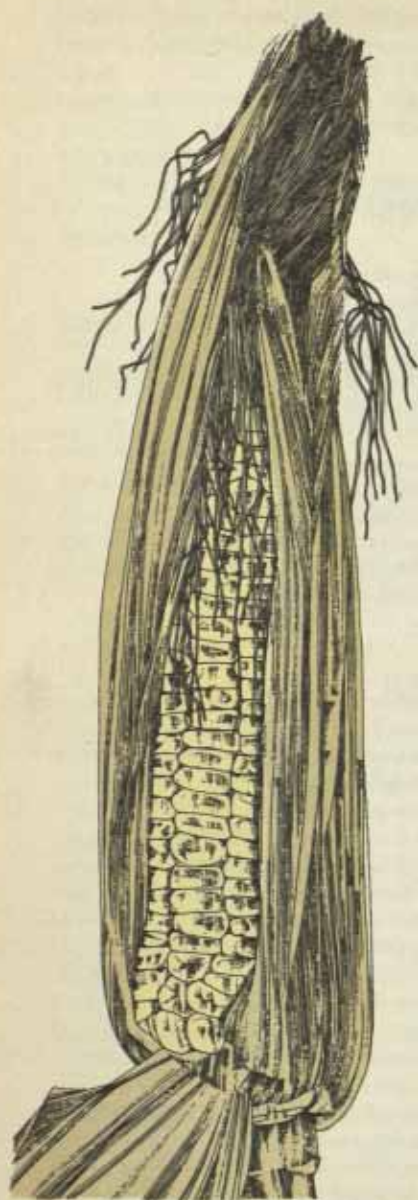
Sweet corn is a specially selected type of maize and is a vegetable that is increasing in popularity. The season in Britain is short.

SOIL PREPARATION

Almost any soil suits sweet corn provided it has been amply fed with well-rotted organic matter. If possible use ground that has been well manured for a previous crop and kept clean by shallow cultivation. Where this is impossible, dig the plot to a spade's depth and add half a bucketful of well-rotted farmyard manure or compost to the sq. yd. Allow the ground to settle for at least a fortnight. A day or so before planting or sowing, rake into the top inch of soil fine sedge peat at the rate of half a bucketful to the sq. yd., to give a 6-in.-wide strip on either side of the plants. Add a fish manure at 4 oz. to the sq. yd.

SOWING

To give sweet corn as long a season's growth as possible while still having the cobs ready early in the summer, sow the seeds in Eclipse No-Soil compost or in



SWEET CORN—Golden Glory

John Innes potting compost No. 1 in March. Put two seeds in the centre of a 2-in. pot filled with the compost and thin down to one plant per pot if both seeds grow. Stand the pots on the staging of a greenhouse with a temperature of 55° F. (13° C.) and water from time to time. Early in May start the hardening-off process by putting the plants out into a frame. Plant out in the open about the third week in May; it helps pollination if the planting is done in 2 by 1 ft. rectangles rather than in a row.

If no greenhouse is available, sow two seeds at stations 2 by 1 ft. in the open in the middle of May. Where both seeds grow, thin down to one per station. It helps to ensure good germination if up-turned glass jam jars are placed over the seeds. These need not be removed until the plants are about 3 in. high. A third method of sowing is to use cloches or ganwicks in early April in the south and late April in the north. Sow the seeds 9 in. apart and remove the glass when the growth of the foliage makes it necessary.

#### GENERAL CARE

Earth up the plants a little when they are about 1 ft. high and they will produce

stronger roots, which will give the plants more support. During the summer, the plants may need three-quarters of an hour of artificial rain or a good watering with hose or can once a week. Mulch the soil all over the plot to conserve as much moisture as possible.

#### HARVESTING

The cobs should be ready for harvesting about three or four weeks after flowering finishes. The tassels will turn brown and begin to lose their silkiness. Pull back the protecting green sheath and press one or two of the grains with the thumbnail. The contents should spurt out with the consistency of thick cream.

If the cobs are pulled too early the grains will be watery; if pulled late, the grains will be hard, dry and unpalatable.

#### RECOMMENDED VARIETIES

Early Golden Market, early, yellow-golden grains.

Golden Bantam, tender yellow grains. Very sweet and fairly hardy.

Golden Glory, cobs 8 in. long, with 14 rows of grains. Matures early and is a heavy cropper.

John Innes Hybrid, an early maturing, sweet variety. Grows up to 5 ft. tall.

## TOMATOES

Though much of the tomato growing in Britain is done in greenhouses (see *The Use of Glass in the Garden*) it is possible to get good crops out-of-doors if the right varieties are grown. In very cold, wet years the plants are often attacked by potato blight disease. Lack of sunshine also means that the fruit will not ripen in the open, and it has to be brought indoors to complete the ripening.

It is usual either to buy plants ready to put out in May or June, or to raise plants from seed under glass. It is less satisfac-

tory to sow seed out-of-doors but it can be done, provided the seedlings are carefully protected.

When buying tomato plants be sure to get well-hardened, sturdy, dark green specimens. At planting time tomatoes should be about 8 in. high; do not put in plants that look weak, feathery or diseased, or that seem to have large spaces between the leaves.

#### SOIL PREPARATION

Light or heavy soils may be used for tomatoes. It is advisable, however, to dig



heavy soil into ridges in November so that a greater surface area can be broken up by frost and cold winds. In April put well-rotted compost or manure into the furrows at the rate of one bucketful to the yard run. Then pull down the ridges with a draw hoe, to cover the manure and form new, shallow ridges,  $2\frac{1}{2}$  ft. apart, in which the tomatoes may be planted.

If the tomato plot is of light, sandy soil, dig in manure during the spring.

#### SOWING

The most important point to remember when growing from seed, however the seedlings are to be raised, is to buy varieties suitable for outdoor growing.

#### SOWING IN THE GREENHOUSE

Sow seed any time between February and May, 2 in. apart in boxes of John Innes seed compost or Eclipse No-Soil compost, and cover with a sheet of glass until germination. Then give as much light as possible, and after about 28 days, pot up into 3-in. pots of John Innes potting compost No. 1. These plants will need hardening off before planting out. Full instructions are given in *The Use of Glass in the Garden*.

#### SOWING IN FRAMES

Sow early in April in 3-in. pots filled with John Innes seed compost or Eclipse No-Soil compost.

Sow three seeds,  $\frac{1}{2}$  in. apart and  $\frac{1}{2}$  in. deep in the centre of each pot and thin the seedlings down to one per pot. Leave in the frame until the end of May, hardening off before planting out.

#### SOWING IN THE OPEN

The time to sow seeds where the plants are to grow is early in May. Sow three seeds  $\frac{1}{2}$  in. deep at each station and cover with an inverted 2 lb. glass jam jar. The stations should be 15 in. apart in rows  $2\frac{1}{2}$  ft. apart. Thin down to one plant later if necessary.

#### PLANTING OUT

A day or two before planting, level the ground and rake in a fish manure with a 10 per cent potash content or a complete fertilizer at the rate of 4 or 5 oz. to the sq. yd. The main planting is done late in May in the south and early in June in the north, when all fear of frosts has passed. It is no use attempting to plant tomatoes if the soil is really wet and cold.

Make the rows  $2\frac{1}{2}$  ft. apart and allow 15 in. between the plants. To disturb the roots as little as possible when planting, make a good hole with a trowel and plant the ball of soil containing the roots complete. Plant so that the top of the ball is about  $\frac{1}{2}$  in. below the level of the soil. Use the handle of the trowel to firm the soil all round the plant. Immediately after planting, push a strong 4-ft. bamboo into the ground at the side of the root ball.

#### GENERAL CARE

After the first truss of flowers has set, give liquid plant foods with a 10 per cent potash content once a week during the season. As it is more convenient if the plants are kept to a single stem, remove the side shoots which appear at the point where the leaves join the main stem. Be sure to remove only the side shoots, and not to damage the incipient flower truss. The side shoots can be pinched out between finger and thumbnail, but it is safer to cut them away with a knife.

Never handle tomato plants with nicotine-stained fingers or use a knife that has cut tobacco, or tobacco viruses will be transferred to the tomatoes.

As the plants grow, tie the stems of the plants to the bamboos with green cotton twine or raffia. Wrap the twine or raffia twice round the bamboo and then put a loop round the plant and tie it to the bamboo; if the tie is too tight it will cut into the stem as the plant grows.

As the plants will stop growing and



#### TYING AND DE-SHOOTING TOMATOES

After planting tomatoes, push strong bamboo canes into the ground at the side of the root ball. As the plants grow, tie each stem to a cane. Remove side shoots that appear where the leaves join the main stem, to ensure that the plants are kept to a single stem.

cropping when the short days of October come or an early frost touches them, pinch out the growing point of each plant during the first week of August, removing the top inch. The elaborated sap will thus be directed to swelling and ripening the fruit rather than to making any further growth. It will still be necessary, however, to continue to remove the side shoots carefully.

Do not remove the leaves of the tomatoes until they turn yellow: they manufacture the elaborated sap that feeds the fruit and helps it to mature.

#### BLIGHT

Watch out for potato blight disease, which usually occurs in late July in the south and about the second week of August in the north. As a preventive, spray with Bordeaux mixture and spray again a fortnight later.

#### HARVESTING

Use the tomatoes as they ripen. If, at the end of the season, there are trusses of

green tomatoes on the plants, cut them off to ripen on a windowsill, or wrap the individual fruits in newspaper to ripen off in a drawer.

Alternatively, if ganwicks or cloches are available, put down a layer of straw or sedge peat on the strips where the plants are growing and, having taken away the bamboos, lay the plants down as they are on the straw or peat and put the cloches or ganwicks over the top. The fruits will continue ripening while the plants are on the ground.

#### RECOMMENDED VARIETIES

Be sure to buy the seed of varieties which have been specially raised for outdoor growing.

Essex Wonder, excellent quality red fruit. Fine cropper.

Harbinger, medium-sized fruit of good quality. Plants are short-jointed and can carry a heavy crop.

Ibbetts Seedling, fine quality, solid fruit for shape and size.

Open Air Wonder, bears a heavy crop of pear-shaped fruit.

Orange Sunshine, a yellow variety. Round, regular fruit on vigorous plants.

#### DWARF OR BUSH TOMATOES

Bush tomatoes do not need staking or pinching. Plant them 15 in. square in double rows. They will grow less than

1 ft. high and will spread themselves over the ground. If the soil is covered with sedge peat  $\frac{1}{2}$  in. deep at planting time, it will help to keep the fruit clean.

#### RECOMMENDED VARIETIES

Amateur, very early. Small fruits.

Dwarf Gem, medium-sized fruits with pale green backs.

## TURNIPS

Turnips require soil rich in organic matter so that the roots mature quickly and are tasty and tender.

#### SOIL PREPARATION

Do not try to grow turnips on sandy, thin top-soils. Turnips grow well on fertile, loamy soil which retains moisture well, though the later main-crop turnips are not so particular, and will grow on loams and clays provided they are well cultivated and manured.

Dig in well-rotted compost and dung at the rate of one large barrowful to 8 sq. yds. In addition, apply a fish manure with a 6 per cent potash content at 3 to 4 oz. to the sq. yd. and, unless the soil is limy or chalky, give a surface dressing of carbonate of lime at 7 oz. to the sq. yd.

#### SOWING

Sow the first early turnips in drills 9 in. apart and  $\frac{1}{2}$  in. deep early in March in the north and late in March in the south. When the plants are through, thin them out to 4 in. apart in the rows. A second sowing of earlies may be made early in April in the north and in mid-April in the south, in drills  $\frac{1}{2}$  in. deep and in rows 1 ft. apart. Later thin the plants to 6 in. apart in the rows.

Sow winter turnips about the middle of July in the north and at the end of August in the south, with the drills  $\frac{1}{2}$  in. deep and 1½ ft. apart. Thin the seedlings

to 1 ft. apart in two separate operations.

Sometimes turnips are grown entirely for their leaves. The sowing is then done early in September with the drills 2 ft. apart. Sow the seed thinly and allow the plants to grow naturally. When the tops are about 8 in. high they are ready for use.

#### GENERAL CARE

Turnips are always very badly attacked by turnip flea beetle, so it is necessary to dust with a B.H.C. dust, D.D.T. or lindane when the seedlings first come through the ground and often even before this. In order to ensure quick growth in dry weather, use a square-area rainer along the rows for half an hour once every week. The ground may be mulched with sedge peat  $\frac{1}{2}$  in. deep on either side of the plants.

#### USING

Pull the earlies when the roots are young and fresh. Never let them get coarse or go to seed. Winter turnips may be left in the ground until they are needed, or they may be dug up in November and, when the tops have been cut off, stored in a clamp in the same way as potatoes.

#### RECOMMENDED VARIETIES

##### Early

Early Greentop Stone, white globe-shaped roots with green tops. Hardy.

Red Top Early Milan, a purple-topped, flat-shaped root. Very early.



Early Snowball, a medium-sized, white globe variety of good quality.

Early White Milan, flat white root of good quality. One of the earliest varieties.

*Winter*

Golden Ball Selected, a small-topped,

yellow, globular variety. Withstands the winter well.

Manchester Market, has solid, sweet-fleshed, white, globular roots with green tops. Hardy variety. Suitable for sowing at any time.

## WATERCRESS

Although grown in shallow water, watercress will often crop well in trenches or troughs which can be kept moist. A shady spot should be used if possible.

### SOIL PREPARATION

Fork plenty of fine organic matter into the bottom of a trench a spade deep and a spade's width across; sedge peat is ideal for the purpose, used at the rate of two large bucketfuls to the yard run.

### SOWING

If plants are to be raised from seed, sow the seed thinly in John Innes seed compost in boxes in early April, and cover with a little silver sand. Put the boxes on the staging of the greenhouse with a temperature of 55° F. (13° C.). Water through the fine rose of a can.

When the seed germinates, prick the seedlings out, 3 in. apart, into other boxes containing John Innes potting compost No. 1. A fortnight later put the boxes out in a cold frame to harden off the plants. It is important at this stage to keep them in the sunlight.

### PLANTING

Soak the bottom of the trench and plant out the seedlings 6 in. apart, zigzag fashion. Water well at least once a week from then on.

### GENERAL CARE

A month later start feeding the plants every week with diluted liquid manure. If any plants start to flower, cut off



WATERCRESS

the tops to prevent flowering shoots developing.

Keep slugs at bay with Slugit pellets.

### HARVESTING

Cut the watercress when needed during the summer. The more the tops are cut the more growth will be made. The bed will need to be completely cleaned at the end of the season.

There are no true varieties of watercress, but there are bronze and green types. The bronze type is generally preferred and has larger leaves, but the green type is easier to grow.

# EXHIBITING

FOR many people, one of the most satisfying aspects of gardening is to enter their produce for competitions at horticultural shows.

Up and down the country, shows of this kind are a traditional feature of village and town life. They are usually organized by local horticultural societies or by village produce associations, and nowadays many firms sponsor shows for the benefit of their employees. On a more ambitious scale, town councils or corporations may arrange shows at their town halls, or in marquees in their main parks.

## SCHEDULE

Before entering for a show, obtain a copy of the show schedule, and carefully read the rules and notes it contains. They will explain precisely what the organizers expect: how many examples of the fruit,

vegetable or flower must be shown; the closing date and fee for entries; the times between which exhibits must be staged.

Novice competitors will find that experienced entrants and show judges will give advice on growing for exhibition and on the general management of entries. The Royal Horticultural Society has published a book entitled *Horticultural Show Handbook* (see *Bibliography*), for the guidance of exhibitors and show officials.

## STAGING

Staging—the arrangement of entries on the judging bench—is very important. Although marks are not awarded for staging, exhibits that are attractively displayed will certainly gain the judges' attention. Show organizers often provide plates, frames, etc. for staging, so make enquiries before the show.

# FRUIT

## PREPARATION FOR SHOW

For a local show most fruit may be collected and prepared the day beforehand.

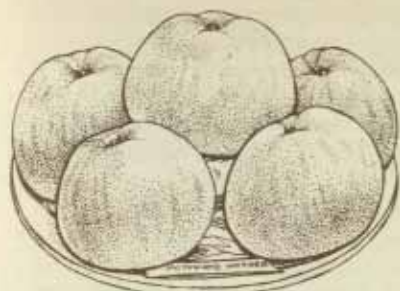
All fruit should be ripe, and although apples and pears may be shown in an unripe condition, preference is generally given to ripe fruit that is in season. Over-ripeness in any fruit is a serious defect.

Do not remove the natural bloom from fruit, particularly that of grapes and plums, and on no account polish apples. Always leave the stalks on all fruit for exhibition, and make sure that all specimens chosen are free from blemishes and disease or pest damage.

Uniformity of size, form and colour is

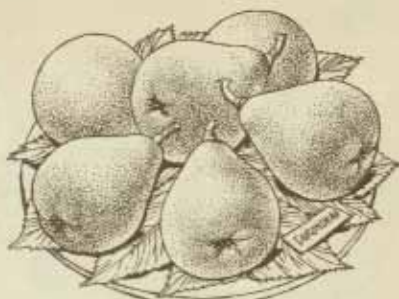
most important, and is usually awarded 25 per cent of the total points. For show purposes all fruits, except dessert apples, should be somewhat larger than average for the variety. Dessert apples should be about 2½ in. in diameter, although a slightly larger size is permitted for a few varieties, such as Blenheim Orange, Charles Ross, Rival and Wealthy. For dessert apples to be more than 3 in. in diameter is usually considered a fault.

If there is some doubt as to whether a particular variety of apple or pear belongs to the culinary or dessert class, consult the R.H.S. *Horticultural Show Handbook* or a good fruit book or catalogue for guidance.



#### STAGING APPLES

Choose apples that are of a uniform size, shape and colour, and exhibit them on a plate made of stiff paper



#### STAGING PEARS

Show pears on a plate covered with fresh green leaves. Leave the stalks on fruit for exhibition

#### SOFT FRUIT

For show purposes there are only two kinds of currant. Black is one kind; red and white are different types of the other kind. Therefore in a class for four kinds of soft fruit, red and white currants cannot be included as two separate kinds.

The red currants chosen should be the largest of the crop and of a brilliant colour. Black currants and blackberries should be jet black and bright.

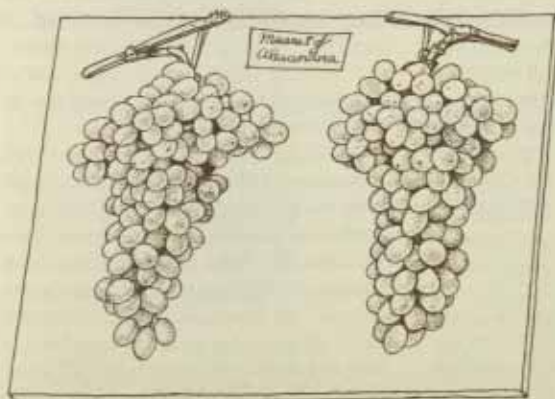
Plums and gages are classed as stone fruit and, therefore, are not eligible for inclusion in soft fruit classes.

#### TRANSPORT TO SHOW

If the fruit has to be transported any distance, wrap hardy fruits separately in tissue paper, and pack in wood wool or crumpled newspaper in a cardboard box to avoid bruising or spoiling the bloom.

#### STAGING

Place the fruit, of whatever kind, on a bare, plain plate (stiff paper plates are ideal), or on large, fresh, broad green leaves on a plate. Do not include more than one variety of fruit in the same dish if the schedule specifies "one variety".



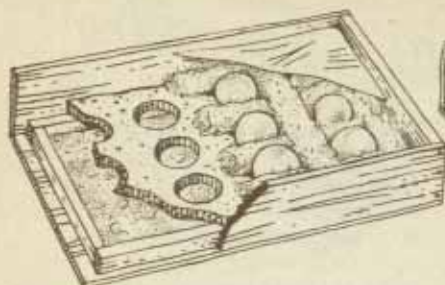
#### GRAPES

##### FOR EXHIBITION

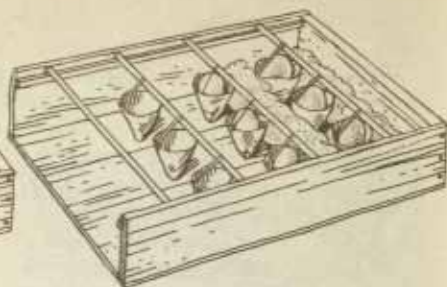
Bunches of grapes look effective on a board covered with a sheet of white paper. It is particularly important that the natural bloom should not be rubbed off



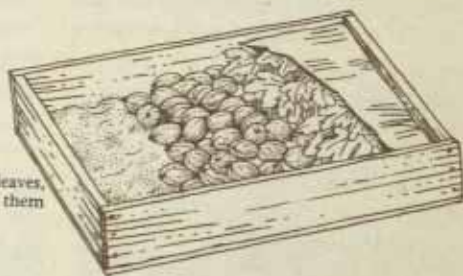
## PACKING FRUIT



Place single peaches and nectarines in holes cut in a thick felt resting on a bed of cotton wool. To give added protection, separate the fruits with cotton wool rolled on dowel rods



Make a small conical paper bag for each plum. Attach the bags to rods stretching across the top of the box and pack wads of cotton wool between the rows



Lay the gooseberries, with their leaves, on a bed of cotton wool and cover them with tissue paper

## VEGETABLES

In the vegetables section, merit depends on condition, size, uniformity and freedom from disease or pest. Condition covers cleanliness, freshness, tenderness, and absence of coarseness and blemishes. The size of the vegetables may be somewhat larger than that normally seen at a greengrocer's; however, the judges look not only for size but for quality as well. Uniformity means similarity of size, form and colour.

## KINDS OR VARIETIES

The words "kinds" and "varieties" occur frequently in show schedules, so be careful to exhibit exactly what is specified. For instance, if "four kinds of vegetables"

are asked for, then potatoes, cauliflowers, carrots and peas could be entered, not four different varieties of one kind of vegetable. Kelvedon Wonder and Meteor are different varieties of the same kind of vegetable—peas—so both would not be eligible for the same class.

Schedules often include, at the end of a section, a class for "any other kind of vegetable not included above", and here again confusion can arise. If, for instance, there is a class for "long carrots" in the main section, but not a class for "stump-rooted carrots", the latter could not be included in the class for "any other vegetable", as they are merely different types of carrot, already provided for in the schedule. The

same rule applies to globe and long beet.

But for show purposes savoy cabbage is a different kind of vegetable from green cabbage, so that savoy cabbage and green cabbage could be exhibited as two separate kinds of vegetable.

#### CARROTS AND PARSNIPS

Carrots of show standard are not easy for beginners to produce, but a dish of good long carrots is well worth staging and looks very impressive on the bench. Cut back the tops to about 1 in. and tie neatly with raffia or green twist. Carefully sponge the roots with clean, cold water, but do not scrub or treat them roughly or the tender skin will be damaged. Remove root hairs but preserve the long tap root.

Although it is not easy to lift well-grown long carrots in dry weather without breaking the root, it can be done. Carefully dig down at the side of the root, then flood the hole with water. When the water has drained away, ease the root



#### CARROTS

Cut back the tops to about 1 in. and tie neatly with raffia or green twist. Carefully sponge the roots, then remove the root hairs but preserve the long tap root. A plate covered with parsley makes an effective background



#### THREE HEADS OF CELERY

Clean the roots and trim them back to the base of the leaf stalk. Choose uniform, solid heads and tie with raffia

from the other side, pulling gently but firmly. It should then come out intact. The same treatment can be applied to parsnips. While the carrots are growing, earth them up or give them a good deep mulch, to prevent the shoulders becoming greened by exposure, which in keen competition is a major fault. Stage the carrots or parsnips attractively on a plate covered with parsley.

#### CAULIFLOWERS

Cauliflowers for exhibition should have clean, large, white, even curds of good texture. Trim the stems before exhibiting. A pair of really good cauliflowers is extremely valuable for inclusion in a collection of vegetables.

#### CELERY

Well-grown celery makes an imposing exhibit. The heads should be large and solid (but not coarse), well blanched and free from slug or other pest damage, with roots neatly trimmed back to the base of the leaf stalks. The stalks should be thick and not stringy or pithy, and should be tied together at the top. There should be

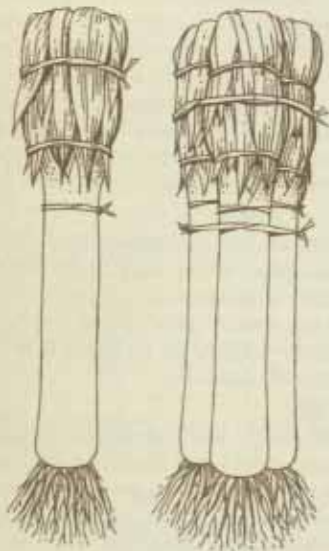
## EXHIBITING

no sign of seeding. Judges may cut through the middle of the heads to see if seeding has started.

### LEEKS

Blanched leeks, as distinct from pot leeks, are first-class subjects for the show bench. Really good leeks, 2 to 2½ in. in diameter with at least a 1-ft. length of blanch, stand a good chance of winning the "Best in the Show" Blue Ribbon. Treat the leeks very carefully. To lift them from the ground, tie the tops together in at least two places, then fork round the leeks and ease them out.

Do not cut off the roots, but hold them under running cold water, teasing them out until all the soil is removed and the roots are white and clean. Just before leaving home for the show, remove the minimum number of damaged, discoloured or split outer leaves until good, clean, perfectly-blanched leeks are left.



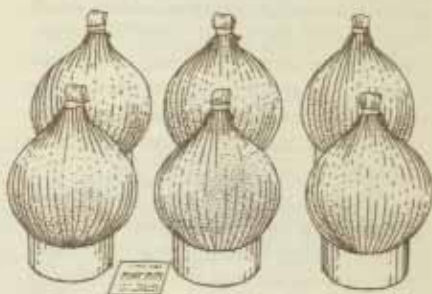
LEEKS

Clean but do not cut the roots. Just before exhibiting, remove damaged leaves, and tie the foliage

### AUTUMN-SOWN ONIONS



After withering, cut back the tops of autumn-sown onions to about 3 in., then turn them down and tie with raffia



### STAGING ONIONS

Display the onions on cardboard rings. The rings at the back are deeper than those in front

Then wipe them with a damp cloth so that they are perfectly white. Wrap each leek in clean white tissue paper to protect it from discoloration, then bundle three or six leeks together in several sheets of newspaper and tie carefully. Exhibit the leeks with full length of leaves neatly tied up, or with the ends just tipped if they are extra long.

### MARROWS

Judges usually stick a thumb-nail into the top end of marrows to test the vegetables' youth and tenderness, and if the skin is hard and resists the nail, the marrows will be passed over. In shows from July onward, there is invariably a class for "a pair of table marrows". In such a class it would be a great mistake to exhibit a pair of very large marrows weighing 20 lb. apiece; what is required is a young pair,



about 10 in. long, well matched, and just right for eating.

#### ONIONS

There is more merit in winning first prize in this class than almost any other, except that for a collection of vegetables, for onions are a great test of the grower's skill; half a dozen onions weighing about 2 to 3 lb. each will almost certainly win a prize at a local show. The onions should be sound, well matched, well ripened and have thin necks. Provided they are being entered in open classes, there is no reason why the same six onions should not win first prize at half a dozen different shows. The disadvantage of this practice is that judges poke their thumbs into the base of the necks of the onions to test for soundness, and this eventually induces softness, thus rendering the onions unfit for further competitions.

Spring-sown onions should always be shown with their tops, but the tops of autumn-sown onions and those produced from a box-sowing in January should be allowed to wither; they should then be cut back to about 3 in., turned downward, and neatly tied with raffia or green twist.

To stage six onions really effectively, make six rings from a cardboard cylinder  $2\frac{1}{2}$  in. in diameter, cutting three rings 2 in. deep and the other three  $1\frac{1}{2}$  in. deep. Set out the rings with the taller ones at the back and place the onions on them.

#### PEAS

For exhibition purposes choose young, large, well-filled pods that are uniform in size, have their natural bloom intact, and show no signs of greyness. Cut the pods from the plants with a pair of scissors and handle them only by the stalks. To test for fullness, hold the peas up to a strong light to see the seeds. If they are maggoty do not include them in the exhibition entry, as they may well be

the ones the judges open. Stage the peas on a plain plate or in a shallow basket.

#### POTATOES

Potatoes should be of uniform medium size, shallow eyed, of good shape, and with clean, unbroken skin free from blemishes. Try to stage specimens that are characteristic of their variety.

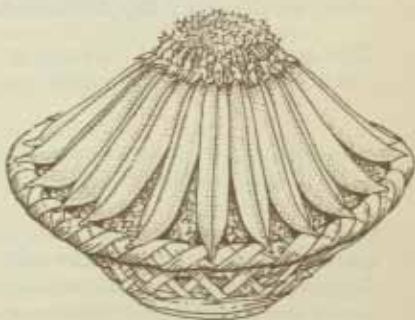
Stage the potatoes on a plate, rose end outward and with the best specimen on top. Place sprigs of parsley between them.

#### RUNNER BEANS

Runner beans are popular for autumn shows. Twelve beans are usually called for. They should be young, long and straight, of even size, with stalks and little or no outward sign of seeds. The judge will take a sample bean and snap it in two to test for plumpness and tenderness. The break should be clean and the section full, that is, with no piping down the middle. Stage the beans in a row or pile them on a plain plate.

#### SHALLOTS

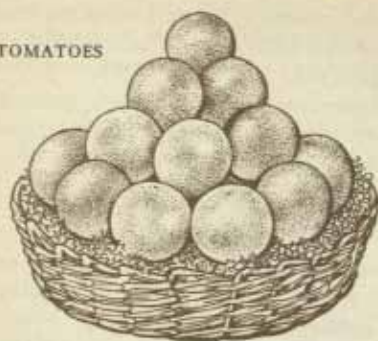
Twelve shallots are usually asked for in the schedule, and these should be well ripened, uniform in size, not too large, thin necked, and very firm, with an unbroken outer skin. Shorten the stems to about 1 in., double back and tie neatly.



PEAS

Fill a basket with moss covered by parsley, and arrange the pods in a cone

## TOMATOES



Fill the basket with cotton wool and cover with parsley. Arrange the tomatoes in the form of a pyramid

Stage the shallots, bedded upright on parsley or sand, on a medium-sized plate

## TOMATOES

For the "grown-out-of-doors" class, select large, perfectly round fruits, uniform in size and of good colour. Be sure that they are ripe but quite firm, and complete with stalk. Stage the tomatoes upside down on cotton wool in a round basket. Be very careful in handling and in transporting to the show, to avoid bruising the fruits. Bruising may induce a soft spot, which the judges are sure to find.

## CLASS FOR A COLLECTION OF VEGETABLES

This is generally regarded as the premier class in a mixed show. The winner may

secure the Blue Ribbon for the best entry in the show, or a medal if the class carries one.

Four or six different kinds of vegetables are usually required. The quantities of each kind are generally specified in the schedule as being the same as those for the separate classes, but the choice of kinds in the collection is usually left to the exhibitor.

When making up a collection of vegetables, it is important to include the kinds that carry the highest points. The R.H.S. *Horticultural Show Handbook* gives a scale of points.

The maximum number of points allotted to any one kind of vegetable is 20, and carrots, cauliflowers, celery, leeks, onions, peas, potatoes and tomatoes all carry the maximum points, while runner and dwarf beans and cucumbers carry 18 points each. These are, therefore, the kinds to choose for a collection. If the exhibitor can include these high pointed vegetables in his collection, he can afford to lose more points on each than a competitor with a mixture of high and low pointed vegetables.

If a number of individual classes are entered as well as the collection, it is best to put the best exhibit in the collection, for this class gains greater prestige than individual classes.

A useful book is *Growing Vegetables for Shows* (see Bibliography).

## FLOWERS

Flowers are usually entered either in specialist shows (such as those for roses, delphiniums or chrysanthemums), or in general shows, which can cover decorative pot plants and cut flowers. But for whatever kind of show, the methods of preparation are the same.

## DECORATIVE POT PLANTS

Select good pest-free specimens, of even all-round growth. Remove any dead leaves, and see that any supports that have been used during cultivation are in good, clean condition, and that the pots themselves are clean. The appearance of bulbs

grown in pots is enhanced if bright green, clean moss is spread over the soil.

If the pots or bowls cannot be carried to the show by hand, pack them carefully in boxes, wedging small bags of peat between the pots to prevent them from moving. If the plants are tall, see that their stems and flowers are adequately supported.

Arrange the pots or bowls attractively, with the taller plants at the back.

### CUT FLOWERS

Select specimens of good texture and colour and of even size and growth. Be careful to avoid those that are already past their full bloom.

Generally, flowers should be cut early on the morning of the show. Remove any lower unwanted leaves from the stems. Then, with the exception of any flowers that are inclined to droop when damp, plunge them to just below their heads in a bucket or can of water. Put them in water as soon as possible, because it does not take long for the stem cells to heal after cutting, and then water is not taken up quickly. To prevent air from entering the hollow stems of plants such as delphiniums, place the thumb over the bottom of each stem immediately it is cut, and then plunge the stem into a barrel of water, removing the thumb only when the stem is in the water. Allow the stem to fill with water, then plug the end with cotton wool. All the bungs thus provided for hollow-stemmed flowers can be removed when the stems are in water at the show.

### PACKING

When packing, first see that the stems and flower heads are dry (especially the stems of those that have been standing in water). Then wrap the blooms in tissue paper or cotton wool so that they are separated from one another, and

either place them carefully but fairly tightly together in a box lined with soft paper, or wrap each bunch in strong paper or metal foil to prevent bruising and as a protection from the wind.

If the show is within easy distance, packing can be avoided; stand the flowers upright in suitable containers and, for preference, in water.

Follow the instructions in the show schedule as to the number of flowers required in each class, and stage the flowers as attractively as possible in vases, baskets or display frames according to the requirements of the competition. Keep all vases topped up with water.

Defoliating for exhibitions is not only permitted but is often advisable to preserve freshness.

### ANNUALS

When exhibiting annuals, make sure that the plants are true annuals and not quick-growing and quick-blooming biennials. The definition of an annual is "a plant that naturally and ordinarily begins and ends its growth, seeds and dies (irrespective of frosts) within twelve months".

Show schedules should state clearly whether or not they permit as eligible in the annual class those perennials that by common usage are regarded as annuals—for instance, antirrhinums.

A useful book is *Flower-Growing for Shows* (see *Bibliography*).

### CARNATIONS

To obtain show specimens of border carnations, disbudding is essential, coupled with rigorous pest control. Providing the soil is right, do not feed border carnations heavily, as this may result in split calyces; this hazard can often be prevented by slipping a rubber band over each calyx.

Perpetual-flowering carnations, grown under glass, are also excellent subjects



**CARNATION BUD**

Carnation calyces are liable to split and so cause the petals to spill. To prevent this, ring the calyx while the carnation is still growing

for exhibition, as their continuous blooming means that specimens are nearly always available.

**CHRYSANTHEMUMS**

Early-flowering chrysanthemums are exhibited at September shows and the late-flowering varieties in November.



Choose long-stemmed blooms, and pack the neck of the vase with moss

Growing chrysanthemums for exhibition demands devotion to the details of cultivation described in *Chrysanthemums*, and the would-be exhibitor will find it worth while to become a member of the National Chrysanthemum Society, which issues literature on the subject.

**DAHLIAS**

Dahlia exhibits are a most important feature of September shows. The long stems lend themselves to very attractive and imposing displays.

Judging and classification nowadays are almost always in accordance with the rules of the National Dahlia Society, and would-be exhibitors should familiarize themselves with these conditions.

Owing to the difficulties of handling and transporting very large blooms, the smaller types, which are so much easier to manage, are now more often shown.



Stage large blooms singly, supporting the stem with a wire

**CHRYSANTHEMUMS**

Size of bloom (see *Dahlias*) used to be all important, but the National Dahlia Society has ruled that quality must take precedence over size, subject to the flowers being shown in their correct classes. There is one exception to this ruling: for exhibition purposes the small pompon varieties must not exceed a diameter of 2 in.

#### GLADIOLI

There are three main sections or classifications for gladioli: Grandiflorus, Primulinus (florets hooded and 3 in. or less in diameter) and Primulinus Grandiflorus (florets hooded and over 3 in. in diameter).

A good spike for exhibition should be straight and of good length and have at least five florets open. The florets should be well balanced—that is equal in size, well spaced, and all facing to the front—and they should be of good colour and freshness. Take particular care to see that the bottom flowers are not fading.

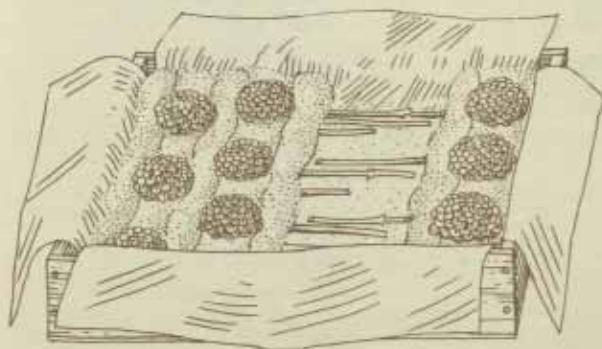
#### HARDY PERENNIALS

These cover a very wide range, but note whether the show schedule calls for "hardy herbaceous perennials" or "hardy perennials". Herbaceous perennials have non-woody stems which die down to the ground each year, but their root stocks promote new growth annually and

remain alive for several years. For horticultural show purposes the phrase "root stock" includes all bulbs, corms and tubers.

#### FANSIES AND VIOLAS

A good way of exhibiting these flowers is to fill a suitable bowl almost to the top with sand, which should be made thoroughly wet and then drained off



#### DAHLIAS

Strip off most of the leaves and pack the neck of the vase with clean moss to hold the blooms securely. For transporting, lay the blooms carefully on a bed of cotton wool in a box lined with tissue paper (left), and separate the heads with rolled-up cotton wool

## EXHIBITING

until reasonably firm. Insert the stalks in the sand so that the flowers all face one way. Alternatively, special short glass tubes, like test tubes, may be used; these are filled with water and then inserted into the sand to hold the flowers.

Show requirements for both pansies and violas are similar; the flowers should be nearly circular and as large as possible without being coarse, with velvety petals of good substance lying flat over each other. The eye of each bloom should be clear and bright and, in pansies, the blotch should be dense and cover the whole of the lower three petals except for a narrow outer margin. Reject flowers with insect or weather damage.



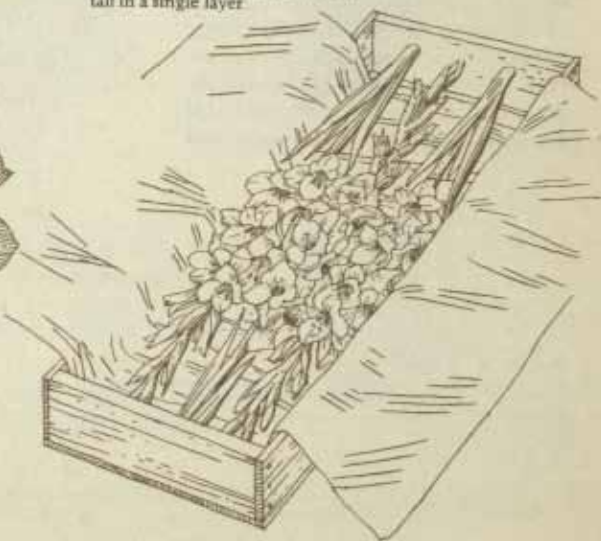
### PANSIES

Place each stalk in a test tube full of water, and insert the tubes in a bowl containing firm sand decorated with leaves



### GLADIOLI

A good bloom bears at least five open florets that are of the same size, are well spaced and are forward facing. The packing case (below) is lined with waxed or greaseproof paper, and the blooms are laid close together and head to tail in a single layer.





## ROSES

These are an important feature of both summer and autumn shows, and schedules are designed to cater for the first crop in June and for the second crop in September.

Roses are usually exhibited as specimen blooms or as decorative vases or bowls. Specimen blooms should be of the highest possible quality, but the decorative effect is more important than quality in the other classes.



## SWEET PEAS

Pack reeds into the vase and trim them flush with the neck. Arrange the sweet peas among the tightly packed reeds.



## ROSES

Roses should not be cut until the day before the exhibition. Small exhibits look effective in a bowl fitted with a wire-mesh support.

## SWEET PEAS

Exhibition sweet peas should have freshness and trueness of colour to the variety; blooms should be perfectly and regularly placed on the stems, which should be long and straight, with size of bloom in proportion; top blooms should be well open and bottom blooms still in perfect condition, with erect standards and rigid wing petals.

Staging is most important. The best method is to pack the vase tightly with reeds and trim them off flush with the top of the vase with an old razor blade. When the ends of the sweet peas are inserted in the tight pack, the stems will stand properly.



## SWEET PEA BLOOMS

The blooms on the left are regularly spaced and are suitable for exhibiting; the right-hand blooms are badly spaced.



## Children's Gardens

**T**HERE are many plants for indoor and outdoor cultivation that produce results in a remarkably short time. These make an ideal basis for a children's garden, which should be full of incident. With guidance, children can derive endless amusement from a plot of land which is set apart for their own use.

### MAKING A GARDEN

Where there is space for a children's garden out-of-doors, the job of actually preparing the ground will come in the spring. First comes the fun of planning

and laying out. During the winter, when the ground is unworkable it is an absorbing task to draw a plan of the garden. The position of flower beds, lawns, paths and rocks, can be marked in different colours. Find out which plants like shade and which like sun, and plan the position of the beds accordingly. A rock garden, for instance, should always be in a sheltered but bright corner.

A children's garden need not be simply a flower or vegetable bed, though many young gardeners take a pride in just such a well-dug, weedless plot of their own.



#### A MINIATURE LANDSCAPE GARDEN

A hill of sand and a piece of undulating turf make the contours. The road is of fine gravel, and the stone ruin is constructed of broken building stones. Burning bushes and various wild flowers are planted in the grass.

#### A LANDSCAPE GARDEN

The site can be laid out as a landscape in miniature. The ground can be heaped up to form mountains and hills, and small trees can be planted in clumps to look like forests. A pile of two or three old grey stones or moss-covered bricks will make a convincing ruined castle, and the roads and paths can be made of fine gravel.

#### A POND GARDEN

A pond garden, which is quite simple to construct, makes a fascinating play-area for children; but do not provide an area or depth of water into which a small child might fall and drown. For details of construction see *The Water Garden*. The pond could be cement-lined and have one or more islands with caves, cliffs and

secret pirate harbours, made by heaping stones in the pond. Plant water weeds that will grow quickly; the pond could also be stocked with fish. Plant dwarf trees round the edge, and make a rock garden with the soil that was dug out when making the pond.

#### A MAP GARDEN

An alternative design for a children's garden might be a relief map of the British Isles or some other country. Mark mountain ranges with stones and forests with miniature trees. Dig ditches for the larger rivers, line them with cement, and fill them with water. If the map is large enough, the different counties could be planted with different-coloured flowers, particularly such low varieties as Virginia stock (*Malcolmia maritima*).

#### A ROSE GARDEN

It is quite easy to make a tiny, formal rose garden. Make lawns from moss, or from some of the dwarf fescue grasses usually found in an old lawn. The miniature lawns can be "mown" with nail scissors. Many miniature rose bushes are quite inexpensive, and none grows taller than 1 ft. high. *Rouletii*, the smallest, is seldom more than 6 in. high. These dwarf roses come in pots, so that they can be put into the ground at any time of year. Treat them like hybrid tea roses, and prune them with nail scissors.

### PLANTS FOR THE CHILDREN'S GARDEN

#### TIME-OF-DAY PLANTS

These are among the most interesting plants to grow, for if a number of different ones are planted, it is possible to tell the time according to which flower is open.

It is necessary to get up very early, at about four o'clock, to see the large blue flowers of morning glory (*Ipomoea*) unfurl. At about midday, the flowers start to



close slowly again. *Ipomoea* is a hardy annual that flowers all summer and will quickly twine its way up a string; it should be sown in April.

Californian poppy (*Eschscholzia*) starts to open at about nine in the morning, and the flowers do not close until about five in the evening. This is a hardy annual that will grow in any ordinary soil. Sow seed in the spring, and it will produce brilliant red or orange flowers during the summer.

The pasque flower (*Pulsatilla vulgaris*) and *Convolvulus tricolor* open a little later than *eschscholzia*, at about ten or eleven o'clock, but usually close at about the same time, though the *convolvulus* may remain open on moonlit nights. Both are easy to grow and should be planted in the spring. The purple pasque flower, a perennial, blooms in April, and *Convolvulus tricolor*, which is an annual, from July to September.

Neither honeysuckle (*Lonicera*) nor the evening primrose (*Oenothera biennis*) open fully until six or seven o'clock in the evening. The scent of the honeysuckle is strongest at this time too, in order to attract the long-tongued moths and ensure pollination. The evening primrose, though yellow, is quite unlike the small primroses seen in the spring. It is one of the most spectacular time-of-day plants, for the flowers burst open very quickly, and at dusk it is possible to watch them opening at the rate of eight or ten a minute. Both plants are easy to grow, and flower all summer. Most evening primroses are biennials, and should be sown in July; honeysuckle is a perennial shrub and can be trained to climb up a wall, trellis or pole.

Several other plants, though not strictly time-of-day plants, react to different conditions in interesting ways. Daisies, thistles and *mesembryanthemums*, for instance, open in sunlight, but close

up in damp weather or rain to protect their pollen.

#### WRITING WITH PLANTS

It is very easy to write a name in flowers, and in this way individual plots can be clearly labelled. Trace the child's name in large letters in the soil, and sprinkle the letters with seeds of Virginia stock (*Malcomia maritima*) or some other small plant. If Virginia stock, an annual, is sown at intervals from the autumn onward, it will produce flowers in a variety of colours from the following spring right through to the autumn.

Mustard and cress grown in the same way will produce a very neat, bushy name, and have the added advantage that they can later be cut for eating. Sow the seed thickly at intervals throughout the summer; mustard germinates more quickly than cress, so it should be sown three or four days later. Do not cover the seeds with soil, but simply press them gently into the ground with a flat board. The seedlings should be ready for cutting in less than a fortnight.

It is also most exciting to watch a name increase in size with the plant. This is done by cutting the name into the skin of a small marrow—as the marrow grows, the inscription grows with it. Marrows can also be decorated by attaching a cardboard stencil to the young marrow with a fairly loose rubber band, to allow for growth. By the time the marrow is ripe it will be green, except for the part covered by the stencil, which remains white. In this way quite an intricate design can be imprinted on a marrow. Marrows should be sown in rich soil in April or May, and cut while they are still young and tender.

#### AMUSING AND UNUSUAL PLANTS

There are plenty of unusual plants that are easy to grow, and which will afford endless amusement to a child.

A loofah is particularly unusual, and useful as well, for in less than a year one plant will provide several small loofahs for the bath.

In April, sow the large black seed of a loofah (*Luffa*) in a pot full of good garden soil. Keep the pot on a sunny window-sill, and by about the end of May, a small, marrow-like plant should have appeared. Plant this out in the garden, and in the autumn the small loofahs, looking just like marrows, will be ready to pick. Put them back on the window-sill to dry out; then peel off the skin to reveal the loofahs inside.

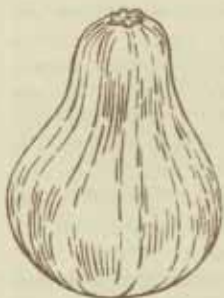
Gourds are also fun to grow and make an attractive form of decoration for the house during the winter. After picking, let them dry a little, then varnish the coloured varieties so that they retain their colour and have a good shine; the white varieties can be painted. Grow gourds from seed in exactly the same way as loofahs.

Many children's games require coloured counters, but these need not be bought. Simply plant beans that have seeds of different colours. For instance, the runner bean Streamline has scarlet seeds, and Masterpiece is one of several broad beans with green seeds. Dwarf beans such as Canadian Wonder (purple), Granda (white), Brown Dutch (brown), Phoenix Claudia (rose-pink) and Golden Butter (black with a white spot), will also provide plenty of coloured seeds to use as counters.

All these varieties are easy to grow and should be sown in late April or during May; two or three further sowings at intervals of a fortnight will ensure a succession of beans for picking during the late summer.

The seeds are also useful for filling small bags for use in place of a ball.

There are some varieties of bush tomato that produce unusual yellow



The seeds in a dried gourd are hard and make useful playthings

#### GOURDS

These fruits make attractive ornaments if, after they have been dried, the coloured varieties are varnished and the white varieties painted



fruit, and others that produce the delicious miniature cherry or currant tomatoes. Bush tomatoes seldom grow more than 1 ft. high and require no staking or pinching out of the side shoots. Plant out in May in a sheltered, sunny position, and the fruit can be picked at the beginning of September.

An attractive and interesting plant for a children's garden is the burning bush (*Kochia scoparia trichophila*). It looks like a miniature pine tree, with masses of narrow leaves, and earns its English name by turning a deep fiery-red in late summer. *Kochia* is a half-hardy annual, and should be sown in April or May.

The rose, *Masquerade*, is another plant that lives up to its evocative name, for its flowers are yellow when they open, deepening in colour to salmon-pink and finally to a rich crimson as they mature. The bush is often covered with clusters of different-coloured blooms at the same time, and is a good illustration of the use of varietal or cultivar names, for *Masquerade* describes vividly the gay carnival appearance of this particular rose. A floribunda variety that grows to a height of about 4 ft., *Masquerade* may be planted at any time from late October to late March when the ground is free from frost and reasonably dry.

If a conservatory is available, or a small corner of the greenhouse, children will enjoy the sensitive plant, *Mimosa pudica*. At the slightest touch the leaves will droop, and the small secondary leaves will quickly close tightly in pairs. If the plant is given an interval to recover, this treatment can be repeated. This mimosa is usually treated as an annual. Sow three seeds in a pot in April or May, keep the pot in a sunny position, and water it well. With careful treatment the plant will live right through the following winter.

Another plant that will amuse children is the mouse-tail plant (*Arisarum proboscideum*). Projecting from arum-like foliage, the base of the green and brown flower-bract looks remarkably like the hindquarters of a mouse, tapering to a curving "tail" about 5 in. long. Plant this hardy perennial in a moist, shady position in early autumn, and it will flower early the following summer.

#### QUICK RETURN PLANTS

Nobody wants to wait a very long time for plants to grow, least of all children, and there are many plants that produce results in quite a short time.

Annuals are among the most satisfactory quick return plants, for they are easy to grow, and if sown in April, will provide a bright display of flowers right through the summer. Some annuals have already been mentioned, but the following are also excellent subjects for a children's garden.

Candytuft (*Iberis amara*) has well-scented flowers in a variety of bright colours from early summer onward.

*Clarkia* produces a succession of showy flowers from July to October. They are pink, lilac or purple, and are excellent for picking, for they last well in water.

Cornflowers (*Centaurea cyanus*) are always popular for their bright flowers, which are usually white or blue and appear in July.

Jumping Jack (*Impatiens roylei*) is an amusing plant, for the ripe seed pods wriggle and curl if held gently between the fingers. If left alone, the pods eventually explode, making a considerable noise, and scatter their seeds in every direction. This plant is a type of balsam, with purple flowers in August. It will grow as tall as 5 to 8 ft. and likes a shady position.

Love-in-a-mist (*Nigella damascena*) has large blue flowers from July to September. The seed heads that follow look like tiny balloons, and it is fun to paint them gold or silver and use them for Christmas decorations.

Mignonette (*Reseda odorata*) has a delightful scent and spikes of yellowish flowers that last from June till October.

Nasturtiums (*Tropaeolum majus*) are always colourful, and the Gleam Hybrids range in colour from deep mahogany to pale orange-pink. Nasturtiums flower all



summer, and the poorer the soil, the happier they are. It is especially exciting to watch the climbing varieties grow.

Scabious (*Scabiosa*) has flowers that look like pin-cushions. The annual scabious are usually blue and are useful for cutting, for they continue to bloom from July to September.

Sunflowers (*Helianthus annuus*) are most exciting plants, for they may grow as tall as 10 ft.; they make a good background for a garden. The yellow flowers, which have round, dark brown centres, are as big as plates, and look almost like human faces from a distance. Plant sunflowers in a sunny position and they will grow very fast, flowering from July to September. Save the flower-heads, for chickens love to peck out the seeds.

Sweet sultan (*Centaurea moschata*) belongs to the same family as the corn-flower, and has fluffy flowers of white, yellow or purple from June to September. It has a spicy scent, and may owe its English name to the fact that it was brought from the Near East, much of which was then under the rule of the Ottoman sultans, in the 17th century.

Tree mallow (*Lavatera trimestris*) has huge rose-pink flowers in June, which continue to appear until the autumn. Find a sunny corner for this tall, hardy plant.

It is quite amusing to mix up any annual seeds that may be left over after planting, add some sand, and scatter the mixture thinly over a spare corner of the garden. An exciting assortment of flowers will soon appear, and the children can have a competition to see who can name the greatest number of kinds.

Some vegetables also produce results in a remarkably short time. As well as mustard and cress, it is possible to have a succession of lettuces and radishes throughout the summer if the seeds are sown at intervals of about a fortnight

from March or April onward. Varieties of lettuce that are particularly recommended for a children's garden are the small, crisp Tom Thumb; the larger Webb's Wonderful; and the very hardy Continuity, which has brown-tinged leaves and a delicious nutty flavour. Early potatoes also grow quickly, but occupy a lot of space. If planted towards the end of March, they will be ready to harvest early in June, by which time it is too late to put in other plants. So do not choose potatoes unless there is a spare corner of the garden that can be entirely devoted to this crop.

#### TREES FOR THE CHILDREN'S GARDEN

Although growing a tree is regarded by most adult gardeners as a long-term project, a child can derive much amusement and interest from planting one or two trees that grow fairly quickly.

##### PLANT A SAPLING

It is most exciting to plant a sapling and keep a record of its development. Make a note of the date on which the sapling was planted, and take a photograph of a child standing next to it; by taking further photographs each year on the tree's "birthday", it is possible to keep an interesting record of the comparative rates of growth. Or the sapling could be planted to commemorate a birthday or some other special event which occurs during planting time. Provided the ground is not frosted or very wet, the young tree can safely be put in at any time from October to March.

Put the name of the tree and any other interesting details on a label, and nail it to a post stuck in the ground near the foot of the tree, as is done in public parks. One of the best trees to plant is Cheal's weeping cherry (*Prunus serrulata rosea*), for it grows quite quickly, and being a weeping variety does not occupy much space.

## A PEACH TREE FROM A STONE

Plant a peach stone about 2 in. deep in a corner of the garden where the soil is well cultivated, and a small tree will soon start to grow. In order to produce fruit, however, the stone must have come from an English peach such as Peregrine; even so, the tree may grow for ten years before producing peaches.

## OTHER TREES FROM SEED

A horse-chestnut tree can be grown from a conker buried 2 in. deep in the garden. To restrict the size of the tree, plant the conker in a large flower pot or an old bucket with holes in the bottom, and bury the pot or bucket in the ground.

An oak tree can be grown from an acorn in the same way. And if one "wing" is detached from a sycamore seed and the remainder is planted in the garden, with the seed-vessel downward, a young sycamore tree will soon appear.

## MINIATURE GARDENS

If space is limited, it is still possible for a child to cultivate a miniature garden, in the form of a sink garden or a window-box placed on a ground floor window-ledge. Even an old biscuit tin can become the basis for a garden if a few holes are punched in the bottom for drainage, and it is painted a gay colour—though it should not be so bright as to detract from the beauty of the flowers. Sink gardens and window-boxes are discussed in detail in *Town Gardens*, but the table on page 123 lists the easiest plants for a child to grow in a sink garden.

Very easy plants for a window-box include snapdragons (see antirrhinums in *Annuals*), and dwarf wallflowers (*Cheiranthus cheiri* Tom Thumb), which should be planted in the autumn to flower the following spring. Pansies take rather longer to grow, being biennials, but they are well worth waiting for. Sow the seed in June or July, and when the

seedlings are about 1 in. high, thin them out to 6 in. apart. The pansies will then produce a mass of flowers in a variety of colours right through the following summer. French marigolds (*Tagetes patula*), alyssums, stocks (*Matthiola*) and petunias will provide a bright display of colour all summer. All are annuals, to be planted in the spring. Perennials for a window-box could include violas and salvias, both of which should be planted in the early autumn.

## INDOOR GARDENING

## MINIATURE GARDENS

Miniature gardens can also be an absorbing occupation indoors; they can even be made without any plants.

Find a bowl 2 or 3 in. deep and half fill it with ashes or sandy gravel. Finish filling with a mixture of leaf mould, sand and stone chippings. Then make or buy some tiny Japanese houses, temples and figures and arrange them in a miniature landscape. Make lakes of looking-glass, or fill a small tin lid with water, after first painting the lid to give the water a realistic colour. Roads and paths, mountains, walls and bridges, can be made of fine gravel and small stones.

The spaces in the miniature garden can now be filled with berries, twigs, leaves and flowers stuck in the sand, or live plants can be put in. The first alternative will amuse the child who likes to rearrange his garden frequently and does not want to wait for plants to grow. In the second case, dig up some mosses and small grasses and ferns from the garden, and plant them in the miniature garden. Be sure to keep them moist, and in a fairly shady position. On the other hand, if the miniature garden is kept fairly dry on a sunny window-sill, try growing *Ionopsidium acaule*, which makes a carpet of pretty mauve flowers less than 2 in. high during the summer and winter. *Alyssum*

## PLANTS FOR THE SINK GARDEN

<i>Plant</i>	<i>Height</i>	<i>Foliage</i>	<i>Flowers</i>	<i>Time of Flowering</i>
<i>Androsace villosa arachnoides</i>	1 in.	silky rosettes	white, honey-scented	May to June
<i>Armeria caespitosa</i> (Spanish thrift)	1 in.	grass-like blue-green	pink	May
<i>Campanula trachelium</i>	up to 2 in.	green	lavender-blue	August
<i>Dianthus alpinus</i>	3 in.	grey-green	pink	July to September
<i>Narcissus cyclamineus</i>	5 in.	grass-like	yellow	March
<i>N. triandrus</i> (angel's tears)	5 in.	grass-like	yellow	March
<i>Primula</i> Mrs. J. H. Wilson	3 in.	green	lilac	April
<i>Sedum rupestre</i>	5 to 8 in.	evergreen	yellow	June
<i>Sempervivum</i> (houseleek)	2 to 4 in.	rosette of fleshy leaves in green, red, purple	insignificant; grown for foliage	

*minimum* Snow Carpet, with pure white flowers less than 4 in. high, and *Calandrinia umbellata*, which is about 4 in. tall and has bright crimson flowers, would also mix in well. Make sure that the soil on the surface of the garden is fine and level. Sprinkle small pinches of seed on the surface and cover with a little more soil rubbed through a fine sieve. Press the soil firm with the fingers; keep it damp until the flowers have started to grow. Thereafter it will need very little water.

## A GARDEN IN A GLASS CASE

A miniature garden enclosed by glass is usually called a terrarium; this type of garden can also be made in a bottle, but considerable skill is needed to insert the

plants through the narrow neck of the bottle (see *Indoor Gardening*). A child will do best to use an old aquarium as a container for the garden. Put a layer of sand 1 in. deep at the bottom of the tank, followed by a thin layer of charcoal and a layer of good, dark, garden soil.

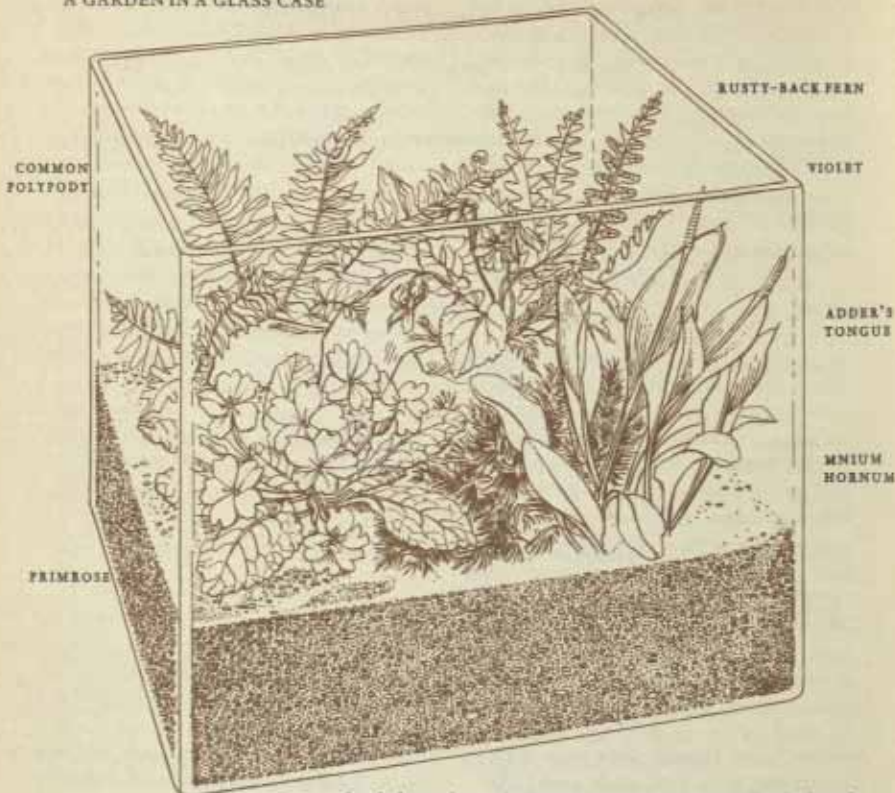
Stock the garden with plants that like shade and moisture, such as the tiny mosses, ferns and other small plants that can be found in most woods and deserted, overgrown gardens. Dig up plenty of soil with the plants, set them in the soil in the glass tank, and give them a fine sprinkling of water.

Cover the top of the tank with a piece of thick paper punched with a few holes to admit air, and keep the tank out of



## CHILDREN'S GARDENS

### A GARDEN IN A GLASS CASE



Stock the garden with mosses, ferns and plants that like shade and moisture. The soil is composed of a layer of sand, a layer of charcoal and finally a layer of garden soil

direct sunlight. The garden will now virtually look after itself, producing its own moisture in the enclosed space, and needing very little watering.

#### AN INDOOR WATER GARDEN

An aquarium or a large glass bowl or jar can also be used to make an indoor water garden. A small water garden can even be made in a 2-lb. jam jar. Put a layer of sand 1 in. deep into the bowl, followed by 1 in. of garden soil and another layer of sand. Then fill the bowl with water and let it stand until the water is clear.

Plants for the water garden can either be bought from a shop which sells aquaria or collected from a pond or stream, in which case be sure to dig up as much root as possible. Water milfoil (*Myriophyllum*), arrow-head (*Sagittaria*), and eelgrass (*Valisneria spiralis*) are all suitable plants.

Push the roots through the top layer of sand into the soil, and then put a few stones round the stems to hold the plants down; otherwise they will float to the top of the bowl.

The sandy floor of the garden can be

decorated with shells and attractive pebbles. If fish are to be included, wait until the plants are well rooted. Even a 2-lb. jam jar will hold one or two minnows. Do not overfeed the fish, or the water will quickly become unpleasant; a few baby water snails will help to keep it free from scum.

Keep the garden away from direct sunlight, and top up the water occasionally. Thin out the plants if they become too thick.

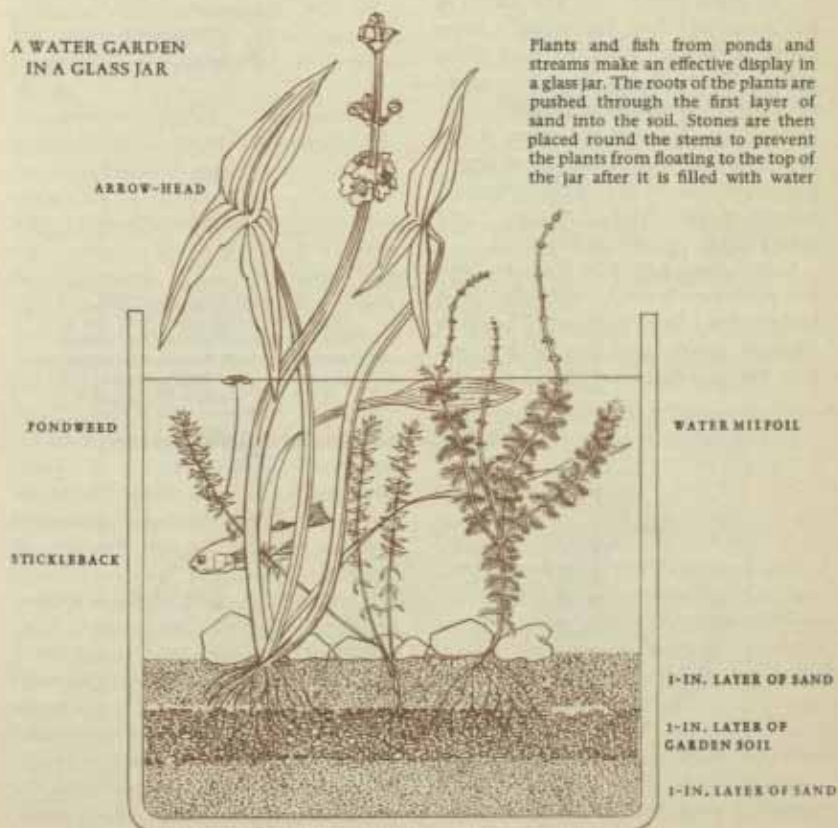
#### BULBS

Bulbs can be grown in the garden, but they will flower earlier if they are planted

indoors. Hyacinths, tulips and daffodils are the flowers usually planted indoors, but smaller bulbs such as crocuses, grape hyacinths, chionodoxas and scillas are just as interesting to grow, and cheaper to buy.

Bulbs are usually planted in damp fibre, but this means leaving them in the dark for several weeks. A child will find it more exciting to watch a bulb grow in a jar. Special bulb vases can be bought, but a glass tumbler, jam jar or milk bottle will do just as well. Fill the jar nearly to the top with pebbles, and add water to just below the surface of the pebbles. Place

#### A WATER GARDEN IN A GLASS JAR



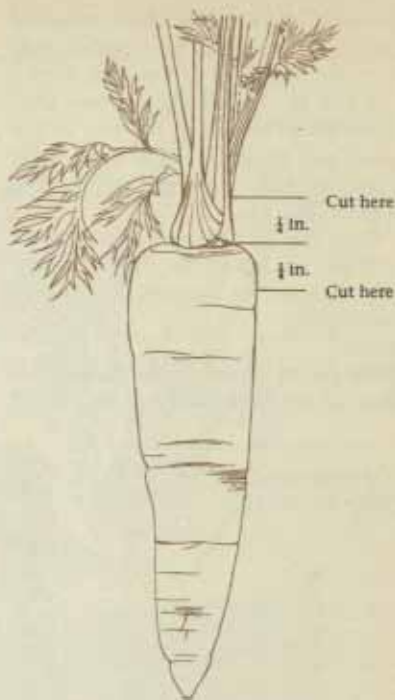
Plants and fish from ponds and streams make an effective display in a glass jar. The roots of the plants are pushed through the first layer of sand into the soil. Stones are then placed round the stems to prevent the plants from floating to the top of the jar after it is filled with water.

the bulb on the pebbles, pointed end uppermost, and make sure that the bulb itself is clear of the water. Stand the jar on a light window-sill, keep the pebbles watered, and the bulb will soon start to push roots down into the pebbles, and to send green shoots upward. Crocuses or other small bulbs can be grown in clumps in a bowl by planting several bulbs in the same way.

#### PLANTS FROM PIPS

It is most intriguing to see how quickly a fruit pip will produce a miniature tree. Plant the pip of an orange, lemon, grapefruit or pomegranate  $\frac{1}{4}$  in. deep in a pot full of good garden soil, and keep the pot warm and dark, for example in an airing cupboard, until the first shoot appears. Then put it on a sunny window-sill. Water the small plant well, and transplant it into a larger pot when it has grown two pairs of leaves. Plants grown from pips indoors will never become large enough to bear fruit, but they make most attractive plants for the house.

A date stone grown in the same way will produce a beautiful leafy plant that looks rather like an aspidistra. The stone needs to be planted rather more deeply than the pips described above, and the



#### A ROOT-TOP GARDEN

When the carrots have been cut in the way shown above, the crowns are placed, leaf stumps uppermost, in a saucer filled with water and left on a sunny window-sill to sprout.





soil should be watered as soon as it starts to look dry.

It is also possible to grow a plant from an avocado stone (the seed). Put some newspaper in the bottom of a jam jar, fill the jar with water, and balance the stone of an avocado in the neck of the jar so that the larger end of the stone just touches the water.

Leave the jar in the airing cupboard for three or four weeks and bring it into the daylight when the first shoot appears. Roots will have grown down into the water by now, and the avocado should be planted in John Innes potting compost in a 4- or 5-in. pot. It may be necessary to break the jam jar to remove the plant for potting up, because the seed will most probably fill the neck of the jar.

#### A ROOT-TOP GARDEN

It is quite easy to make a pretty and unusual garden by growing the tops of root vegetables. A carrot top, for instance, will produce a mass of beautiful fern-like leaves within a few days. Cut the top off a carrot, leaving  $\frac{1}{4}$  in. of the root and  $\frac{1}{2}$  in. of leaf stem. Stand the carrot, leaf stump uppermost, in a saucer of water, and leave it on a sunny window-sill. Keep the saucer filled with water, and the carrot will sprout very quickly.

Other root vegetables can be treated in much the same way, and if, for instance, the tops of a beetroot, a turnip and a parsnip are grown together, the garden will be an attractive mixture of different coloured leaves. Put a layer of clean pebbles at the bottom of a shallow bowl or soup plate, stand the root tops on the pebbles, and wedge them in with another layer of pebbles. Half fill the bowl with water and put it on a sunny window-sill, adding more water when necessary.

A pineapple top will also sprout quite quickly. Choose a fresh pineapple top with a good solid growing top, allow it to

dry for a few days, and then plant it in a bowl of garden soil mixed with sand. Keep it in a warm place, and do not give it too much water.

#### MUSTARD AND CRESS

Perhaps the favourite form of indoor gardening for a child is growing mustard and cress. Just sprinkle the seed on a piece of damp flannel or blotting paper, remembering that mustard germinates more quickly than cress, and should therefore be sown three or four days later. Keep the flannel damp, and before long there will be plenty of delicious mustard and cress for sandwiches.

The cresshog is even more amusing. Buy one of the specially made clay models of a hedgehog or some other animal (it must be made of clay to retain moisture), and soak it in water for five minutes or more. Soak the cress seeds too, and spread them evenly over the cresshog's back with a finger or a knife. Fill the cresshog with water, cover it with an empty tin, and stand it on a plate in a warm place. Top up the water in the cresshog every day, and sprinkle it with water too.

When the cress is about  $\frac{1}{2}$  in. long, remove the tin and stand the cresshog on a light window-sill. It will still need daily watering, and should be protected from direct sunlight and excessive heat. The cresshog's "spines" will soon turn green and be ready for cutting.

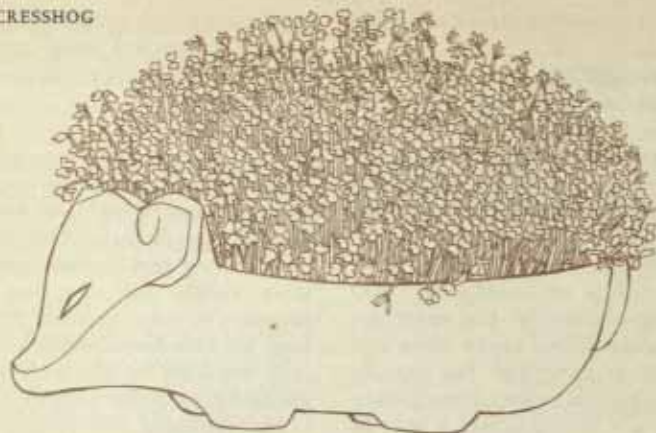
#### PLANTS AS PRESENTS

Plants make excellent presents, for they are both fun to grow and inexpensive to buy. Few things will give more pleasure to a relative or friend than a present of flowers that a child has taken the trouble to grow himself.

#### CHRISTMAS

Bulbs grown in an attractive bowl are always welcome as Christmas presents. It is possible to buy hyacinths and other

## A CRESSHOG



Cress can be grown in one of the specially made clay models of a hedgehog or other animal. The seed is spread evenly over the hedgehog's back and the cresshog filled with water.

bulbs that are specially prepared to flower at this time. Plant them in damp fibre in late September, and keep them in a cool, dark place for about ten weeks, watering occasionally to keep the fibre just moist. By the beginning of December the bulbs should have produced strong shoots. Bring the plants into the daylight and gradually give more heat until they are used to normal room temperature.

## BIRTHDAYS

Bulbs can also be grown for anyone who has a birthday in early spring. For summer birthdays, plan to have some annuals in flower and make up a bunch of as many varieties and colours as possible.

## MOTHER'S DAY

Daffodils are a beautiful present for Mother's Day. Although the date of this festival changes from year to year, being the fourth Sunday in Lent, it always falls at a time when daffodils are in bloom. Plant the daffodil bulbs in a sheltered, fairly shady corner of the garden in late summer or autumn, and by early spring there should be a fine display of yellow flowers, which will last until April.

## LAVENDER BAGS

These make good presents, for the wonderful scent will linger for months. Cut the lavender at the beginning of July, before the flowers are fully open, tie the stems together, and hang them to dry in the airing cupboard for a few days. Meanwhile, make some small bags of fine muslin or nylon. Then rub the flowers from the dried lavender and fill the bags. Wear a handkerchief over the nose like a mask when rubbing the flowers, as the dust that rises from them can be most irritating. Tie the bags tightly with a gaily coloured ribbon.

Lavender is usually grown from small bushes that can be bought from nurseries. The bushes should be planted in September or March.

## COLLECTING AND PROPAGATING PLANTS AND KEEPING RECORDS

## PLANT COLLECTING

Plant collecting can become a fascinating hobby, and one in which the whole family can participate. On holidays, and

during walks in the country, look out for new or unusual plants, and keep a diary or notebook in which to record them. Plants can be exchanged with friends sometimes, too, for few gardens contain exactly the same flowers.

#### PROPAGATION

Another way of collecting plants is to propagate those already grown. Perhaps the simplest form of propagation for a child is to make a collection of seeds from the garden, which will produce new flowers the following year. Gather the seed from plants when they have finished flowering, and put each variety into a different envelope, carefully labelled and dated. Some seeds, such as those of lupins, delphiniums, pinks, poppies and forget-me-nots, can be gathered one day and sown the next. Most seed, however, should be kept and sown the following spring.

Even some shrubs can easily be grown from seed. Sow a seed of broom (*Cytisus scoparius*), for instance, and within two years the bush may be as tall as 4½ ft., with lovely yellow flowers in early summer.

Plants are also propagated from cuttings, geraniums being perhaps the easiest subject for a child. Using a sharp knife, cut a side shoot from the stem of a healthy plant, preferably during the summer. Strip the shoot of its lower leaves and insert it into a bed of fine soil in a sheltered part of the garden. The cutting will soon make roots, and should then be transplanted into the more nourishing soil of its permanent bed.

Stem cuttings taken from rosemary, lavender and willow are easily rooted in the same way.

Another important method of increasing plants is by division, which simply means that the root system of the plant is carefully split into two or more pieces and the separate parts replanted. This is usually done in the spring, when the plants are growing strongly. Bulbs are easily divided, and tulips, especially, increase very quickly; in two years one bulb may increase to as many as twenty or thirty. Plants with fibrous roots, such as Michaelmas daisies (*Aster*), are even simpler to divide.

#### A GARDENING DIARY

The best way to record the work done in the garden is to keep a diary. This will soon become something of a Nature calendar too, for the date of the first daffodil, the first cuckoo-call, a late frost, and other events, will vary from year to year.

It is most exciting to discover that one summer it was possible to pick the first beans two whole weeks earlier than the previous year. And if, for example, the diary contains a note of the fact that when the annuals were in flower last summer there was too much red in the border and not enough yellow, then this will act as a reminder to sow some different varieties this spring. Make a note, too, of any new ideas, or interesting plants seen when visiting other gardens, so that they can be tried out at home the following year.





POMEGRANATE

King Solomon's garden contained many pomegranate trees; a spiced wine was made from their juicy fruits

## Plants of the Bible

"THE Lord God planted a garden eastward in Eden... And a river went out of Eden to water the garden... And the Lord God took the man, and put him into the garden of Eden to dress it and to keep it." Thus the first garden and the first gardener are described in Genesis 2, 8, 10, 15.

The Old Testament provides a good picture of the methods of cultivation and the plants grown in Biblical times.

Flower gardens were then a luxury and only for the wealthy; most people grew plants for strictly utilitarian purposes.

All the gardens of the Bible are set against the harsh and arid conditions of the Middle East; the need for water is constantly referred to, as is also the need for careful dressing, or tending, to preserve the gardens against the ever encroaching wilderness of thorns, nettles and brambles (Isaiah 34, 13). "Doth the

ploughman plow all day to sow? doth he open and break the clods of his ground?" (Isaiah 28, 24) is one of the many references made to ploughing. It appears that harrowing was common in the days of David (2 Samuel 12, 31 and Job 39, 10), and that the composting of vegetable waste was also practised (Isaiah 25, 10).

Then, as now, there were many pests to contend with. Among them were beetles, grasshoppers and locusts (Leviticus 11, 22), flies (Psalm 78, 45), hornets (Deuteronomy 7, 20) and snails (Leviticus 11, 30), as well as mildews and caterpillars (2 Chronicles 6, 28).

The magnificence of royal gardens is described in the first chapter of Esther. They were probably laid out like courtyards with pavements of red, blue and white marble. The beds are described as gold and silver—doubtless they were planted with herbaceous plants that had silver- and golden-coloured flowers.

In the days of the Bible it seems that most plants were fragrant and even the flowers of the vine had exquisite scent. Solomon planted vineyards, gardens and orchards and constructed pools to water them (Ecclesiastes 2, 4-6) and, although his gardens have long since vanished, the Song of Solomon 4, 12-15 recalls their beauty: "A garden inclosed is my sister, my spouse; a spring shut up, a fountain sealed. Thy plants are an orchard of pomegranates, with pleasant fruits; camphire, with spikenard, spikenard and saffron; calamus and cinnamon, with all trees of frankincense; myrrh and aloes, with all the chief spices: A fountain of gardens, a well of living waters, and streams from Lebanon."

Trees, vegetables and spices are mentioned more frequently in the Bible than flowering plants.

Trees, which provide both shade and blossom and eventually fruit, were the outstanding feature of Bible gardens, and

30 different kinds are referred to. The translators of the Bible were theologians and not botanists, so that a number of plants were wrongly named in translation. The tree of knowledge in Genesis 2, 17, which is usually depicted as an apple tree, was probably an orange tree. The word "apricot" has also often been wrongly translated as apple, for true apples were of a poor quality in ancient



OLIVE

Christ spent His last night in the Garden of Gethsemane—"the garden with the olive press"

Palestine and they cannot therefore have been the "apples of gold" referred to in Proverbs 25, 11, nor sweet to the taste as those in the Song of Solomon 2, 3.

The olive tree appears for the first time in Genesis 8, 11, and is mentioned over 50 times more. Its long, grey-green leaves provided shade; its unripe, green fruits were eaten with bread; and the ripe fruits

were crushed to extract the oil which was used for cooking, soap and lamp fuel.

Christ spent His last night of freedom in the Garden of Gethsemane—"the garden with the olive press".

Figs were grown in the earliest days and in Genesis 3. 7 Adam and Eve "sewed fig leaves together" to cover their nakedness. The species of palm tree that bear fruits were also popular. Dates, like figs, were eaten either fresh or dried, the sap

the juice of my pomegranate" (Song of Solomon 8. 2).

Almond trees are mentioned in Ecclesiastes 12. 5; and in the Song of Solomon 6. 11. Solomon speaks of his nut garden, which probably contained walnuts, hazelnuts, chestnuts and pistachio nuts. The "green bay tree" of Psalm 37. 35 is the shrub grown today whose dark green leaves are often used for flavouring. Cinnamon was obtained from the inner rind of the bark of the cinnamon tree, which has leathery, smooth leaves and yellowish-white flowers.

The locust tree, or carob, was also grown at that time—the husks that the prodigal son in St. Luke 15. 16 was hoping to eat were undoubtedly dried locust beans. The word husks means "little horns" and derives from the fact that when children were playing they held the dried reddish beans on either side of their foreheads to make themselves look like goats.

The oak is first mentioned in Genesis 35. 4 and again in 20 other places. Isaiah 60. 13 refers to "the fir tree, the pine tree, and the box together", the box being of the same family as the wild box trees on Box Hill in Surrey.

The wood of some trees was used for building. Gopher wood was used by Noah to construct the ark, and fir was used to build rafters (Song of Solomon 1. 17), but sycamore was the favourite building material until Solomon chose the wood of the cedar of Lebanon for his temple: "And he built the walls of the house within with boards of cedar; both the floor of the house and the walls of the ceiling:" (I Kings 6. 15). The wood of the olive was used for the doors of the Temple (I Kings 6. 32).

Other trees were grown for the scents and oils they yielded. The frankincense tree, with its clear green leaves and attractive, star-shaped, pink flowers, came



SPIKENARD

The ointment made from this fragrant plant was one of the most precious perfumes in Biblical times

of the date palm was used as a drink and the strong leaves were used for weaving into mats. In St. John 12. 13, the crowd that greeted Jesus for the Passover cut down palm fronds and strewed them in His way, crying "Hosanna". Another tree grown in large quantities was the pomegranate. Its juicy fruits made not only a refreshing drink but also a spiced wine—"I would cause thee to drink of spiced wine of



originally from the Himalayas and northern Arabia and produces the finest burning incense in the world. The gum resin of the myrrh tree, found growing along the coasts of the Red Sea, was an ingredient of the holy anointing oil used in the Tabernacle and, with the resin of the aloe, of the salve for the purification of the dead (St. John 19. 39, 40). The resinous product of the balm or balsam tree contained great healing properties, and according to Josephus, the Jewish historian, was among the spices first brought to the Holy Land by the Queen of Sheba (1 Kings 10. 10).

The vine, one of the most important plants mentioned in both the Old and the New Testaments, was cultivated from the earliest days, "And Noah began to be an husbandman, and he planted a vineyard" (Genesis 9. 20). Instructions on vine growing are given in Ezekiel 17, stress being laid on the need for good irrigation. That some vineyards at least were closely guarded is apparent from the account in St. Matthew 21. 33 of a householder who built a vineyard and "hedged it round about, and digged a winepress in it, and built a tower"; and the respect in which the vine was held is made clear in St. John 15. 1 when Jesus said at the Last Supper: "I am the true vine, and my Father is the husbandman."

Many of the fruits and vegetables grown in Palestine were brought by the Jews from Egypt after their captivity. They were cultivated in considerable quantities in the Holy Land, where the gardens were laid out like chessboards so that water could run between the square beds of melons, leeks and cucumbers. The melons in Numbers 11. 5 were probably the same kind of water melon that is grown in Israel today. They are cool and juicy and will grow in a dry soil, for their leaves absorb moisture from the heavy night dew that falls there. The gourd in Jonah

4. 6 is obviously a quick-growing climber: "And the Lord God prepared a gourd, and made it to come up over Jonah, that it might be a shadow over his head." Gourds are closely related to cucumbers, and a garden of cucumbers is referred to in Isaiah 1. 8.

Although leeks are mentioned only once (Numbers 11. 5), they were probably the main vegetable. Onions are mentioned in the same verse and were highly



MANDRAKE

The fruits, called devil's apples, were thought to induce fertility

valued as thirst quenchers. Garlic was another of the plants the Jews missed when they left Egypt (Numbers 11. 5). It is a close relation of the shallot and is still popular in Israel today. The bean in 2 Samuel 18. 28 and Ezekiel 4. 9 was probably the kidney bean, which could be dried or eaten fresh.

The mandrake, a member of the potato family, was also grown, and its fruits, which were called devil's apples, were

thought to induce fertility. This is referred to in Genesis 30, 14, 17: "Then Rachel said to Leah, Give me, I pray thee, of thy son's mandrakes . . . And God hearkened unto Leah, and she conceived, and bare Jacob the fifth son."

The Jews knew how to make the best of their land, and grew the red-seeded lentil on the rocky ground of the olive groves. This small pea-like plant was pulled up and threshed like wheat; its seeds were



CROCUS SATIVUS

Saffron was prepared from the orange-coloured stigmas of this plant

used for the red pottage made by Jacob in Genesis 26, 34.

Most present-day cereals, such as wheat, barley and rye, were cultivated, and millet was also used in the making of bread (Ezekiel 4, 9).

The sugar cane, referred to in Jeremiah 6, 20, was treated as a great delicacy.

Numerous spices and herbs, in addition to the bay leaves and cinnamon already mentioned, were used to give flavour to

food. Solomon refers to calamus, a sweet cane-like plant, and to saffron, a spice prepared from the bright orange-coloured stigmas of *Crocus sativus*. Fitches, a kind of ranunculus, which produce pungent black seeds used to flavour cakes, are mentioned in Ezekiel 4, 9, and a description of the coriander, which bears aromatic seeds and is an umbelliferous plant with leaves like parsley, is given in Exodus 16, 31. The Jews were also familiar with mustard (St. Matthew 13, 31), and the plant named "desire" in Ecclesiastes 12, 5 was probably the caper, which flowers in May and whose buds are bottled in vinegar even today.

"Woe unto you, scribes and Pharisees, hypocrites! for ye pay tithe of mint and anise and cummin", says Jesus in St. Matthew 23, 23. Mint, one of the bitter herbs of the Paschal Feast, was grown not only for its young shoots but because its leaves could be dried and used in winter; anise, or dill as it is now known to have been, is a dainty annual plant whose juice was added to washes to cleanse wounds; and cummin (now spelt cumin) is a small plant whose seeds when crushed were mixed with bread, cake and meat.

But not all the spices were used in the kitchen. Spikenard, originally from Nepal and Tibet, was praised by Solomon for its fragrance (Song of Solomon 1, 12) and its ointment was one of the most precious perfumes. The small, oval leaves of the camphire, or henna flower, which looks rather like a privet and is also highly scented, are still used in many parts of the East to produce a dye to redden hair, hands and feet.

Rue, mentioned in St. Luke 11, 42, is a hardy evergreen shrub whose leaves give off a strong odour and are acrid to the taste. Four species are found in Israel. It was thought to possess powerful medicinal qualities and was frequently used in prescriptions. Wormwood is frequently

mentioned in the Bible, although often metaphorically, as in Revelation 8. 11. This plant bears yellow flowers and is known for its extremely bitter taste. It was recognized as a valuable tonic and stimulant.

The plant hyssop is referred to eleven times, but it is difficult to discover what the plant really is. It may be the plant that the Arabs call "zatar" which has a scent like that of thyme, for this plant has long, slender stems which could have been made into a bunch to sprinkle the sacrificial blood as in Hebrews 9. 19. But Augustine said that hyssop was a short-stemmed rock plant whose roots would penetrate deeply into rocks, and this may be correct because "the hyssop that springeth out of the wall" is mentioned in I Kings 4. 33.

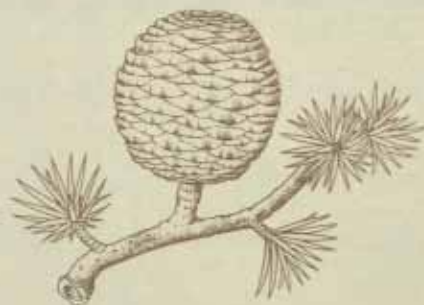
It is difficult when studying the flowers referred to in the Bible to be sure that the translators have really understood the original word—the word "flower" itself has been used in the Old Testament to express a number of Hebrew words. The lily is mentioned again and again. Probably the plant in The Song of Solomon 2. 2 is the madonna lily whose bulbs were eaten as a delicacy, but the lilies

in St. Matthew 6. 28 and St. Luke 12. 27 may have been anemones or merely beautiful wild flowers. There are differences of opinion about the translation of the word "rose", and while it is agreed that the roses in Isaiah 35. 1 were probably narcissi, the "rose of Sharon" in The Song of Solomon 2. 1 may have been either a narcissus or a tulip.

Confusion arises also over the plant called desire, which has already been mentioned, and over the onycha in Exodus 30. 34, which may have been the rock rose, for the Greek for fingernail is onycha and the petals of the rock rose have a fingernail marking on them.

Among the flower names that do not appear to have been mistranslated are *Crocus sativus* (saffron crocus) and the opium poppy: The juice, or gall, of this poppy was mingled with vinegar and offered to Jesus at Golgotha (St. Matthew 27. 34).

Many of the tulips and hyacinths grown in Great Britain today are descendants of the plants the Crusaders brought back from Palestine—the flowers seen by the Jewish spies when they penetrated into the Promised Land and reported it to be "a land flowing with milk and honey".

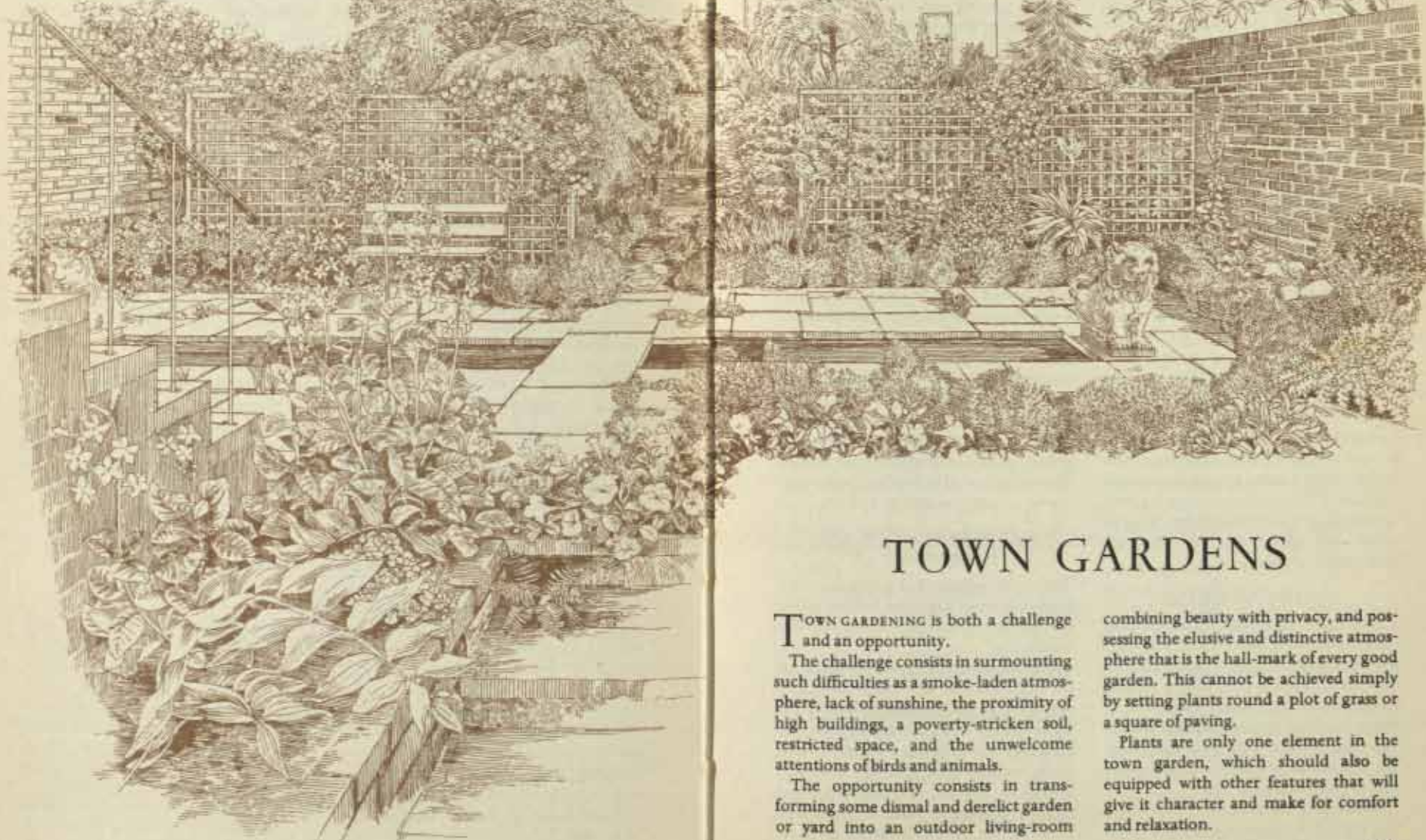


CEDAR OF LEBANON  
King Solomon built his temple  
from the wood of the cedar tree



#### PRIVACY IN A LARGE GARDEN

The steps from the garden door of this town house lead to a paved terrace where twin pools reflect the images of stone figures. Lavender bushes round the paved area give a sweet scent and, as the garden is overlooked by a tall building, screens of trellis and large plants are used at the back to provide privacy



## TOWN GARDENS

**T**OWN GARDENING is both a challenge and an opportunity.

The challenge consists in surmounting such difficulties as a smoke-laden atmosphere, lack of sunshine, the proximity of high buildings, a poverty-stricken soil, restricted space, and the unwelcome attentions of birds and animals.

The opportunity consists in transforming some dismal and derelict garden or yard into an outdoor living-room

combining beauty with privacy, and possessing the elusive and distinctive atmosphere that is the hall-mark of every good garden. This cannot be achieved simply by setting plants round a plot of grass or a square of paving.

Plants are only one element in the town garden, which should also be equipped with other features that will give it character and make for comfort and relaxation.

## PLANNING THE TOWN GARDEN

The town garden should not be regarded as an independent unit, but rather as an outdoor room, and it should therefore be designed in relation to the house that it adjoins. Keep the plan simple and practical, and do not introduce features for the sake of mere decoration. Generally speaking, the centre of the garden should remain uncluttered. If the area is enclosed by high walls, however, it is advisable to make the beds towards the centre, and to raise them about  $1\frac{1}{2}$  ft. above the general level, so that they receive all available sunshine. The garden should always have a focal point of interest, perhaps in the centre area, or at the end of a vista.

The first step in designing the garden is to measure the site and draw up a plan to scale. This provides an opportunity of visualizing different schemes and planning a definite procedure before clearing, digging and planting. Do not forget to consider the garden walls of the house, noting the position of any doors and windows, for these will have a bearing on the layout. Make a note, too, of any natural features on the site, such as trees, a group of bushes, or a difference in levels, all of which will offer scope for interesting treatment in planning.

### PAVING OR GRASS

A town garden frequently consists of only a small area bounded by walls and heavily shaded. The most practical treatment is to transform it into a formal, paved courtyard, using either brick or stone. It is then permanent, easy and inexpensive to maintain, and always appears neat and tidy, with a clean surface that dries quickly after rain.

Although grass is desirable, it is seldom successful in a confined and shady space.

Where the site is open, a small lawn is a feasible proposition, but plan it in conjunction with a paved terrace close to the house for sitting out. Make it from good turves rather than from grass seed, which is difficult to rear successfully in towns because sparrows will raid the seed and make dust baths in the soil. If seed is preferred, choose a mixture of *Poa nemoralis*, S23 rye-grass and creeping red fescue, which will withstand some shade and hard wear. The turf resulting from such a mixture should be mown regularly from a fairly early age.

For terraces and paths the best and most attractive material is York stone in rectangular self-faced slabs laid at random or in broken pieces as crazy paving. It is sometimes possible to buy from the local authority York stone lifted from street pavements. Also satisfactory, and less expensive, are rectangles of an artificial stone such as Pennine paving. Alternatively, bricks and tiles may be laid in attractive patterns—separately, together, or in combination with paving. The bricks should be hard and well burnt and laid in a bed of sand and mortar.

### SOIL PREPARATION AND IMPROVEMENT

The success or failure of plants in a town garden depends upon the fertility of the soil, which involves its texture as well as its richness.

Depending on the condition, measures for improvement will range from partial re-soiling by importing fresh turfy loam to mix with the top-soil, to digging over the planting area in the autumn, making sure that the subsoil is broken up. Leave the surface rough, and apply a dressing of lime at the rate of 2 to 3 oz. per sq. yd., followed some six



weeks later by a dressing of manure. An application of soil conditioner will be beneficial if the ground is heavy and sticky; if it is wet, lay a few tile drains to facilitate drainage (see *Drainage*).

The best way of restoring fertility to sterile soil is to incorporate some humus material while digging. Ideally, this should be rotted stable or poultry manure, but more easily available materials in a town are leaf soil, spent hops, Pompost, crushed bark fibre or peat, supplemented by dressings of dried blood and bone meal.

## GARDEN ORNAMENTS, POOLS AND OTHER FEATURES

Man-made features play an important part in giving character to a town garden, but a garden should be lived with for a while before any special features are installed; garden ornaments should always be used with discretion and their design and placing should be carefully considered. Arches, pergolas and shelters are usually impractical in a restricted space, but there may be room for a pillar or a well-sculpted figure at some strategic point; for a sundial or a bird-bath; for vases and urns, either as ornaments in themselves or to hold plants; and for a seat on the lawn or terrace, under a tree, or terminating a vista at the end of a path.

A bird-bath is a particularly pleasing ornament for a town garden, while vases look attractive placed on the coping of a terrace wall or formal pool, on the terrace itself, or on either side of a low flight of steps.

In a formally designed garden a small round, square or other geometric-shaped pool provides a focal point of great charm. A more natural layout, where the emphasis is on plants, provides greater scope in the shape and placing of a pool.

## LIGHTING

Lighting of some sort is essential if the town garden is to be used as an outdoor living-room on summer evenings. As in the case of garden furniture, utility should never be sacrificed for appearance, but the two can very often be combined.

Have one or two lights shining down on the terrace, and carefully arrange a few more low down in the borders. Another could perhaps be placed in the branches or at the foot of a tree. If the right plants are chosen for illuminating, the result will be most effective. White and yellow flowers show up better than brightly coloured ones, and all grey-, silver-, and shiny-leaved shrubs light up to advantage, particularly if contrasted with neighbouring dark evergreens.

All the lights should be controlled from a switch by the garden door of the house, and the cables need not be buried deeply provided their position is known to those working in the beds and borders.

A competent electrician should be employed to install the lighting.

## SCREENS AND HEDGES

One of the most important requirements for the town garden is privacy, and surrounding borders should therefore be designed to screen the view from both the inside and the outside, as well as to provide an attractive backdrop.

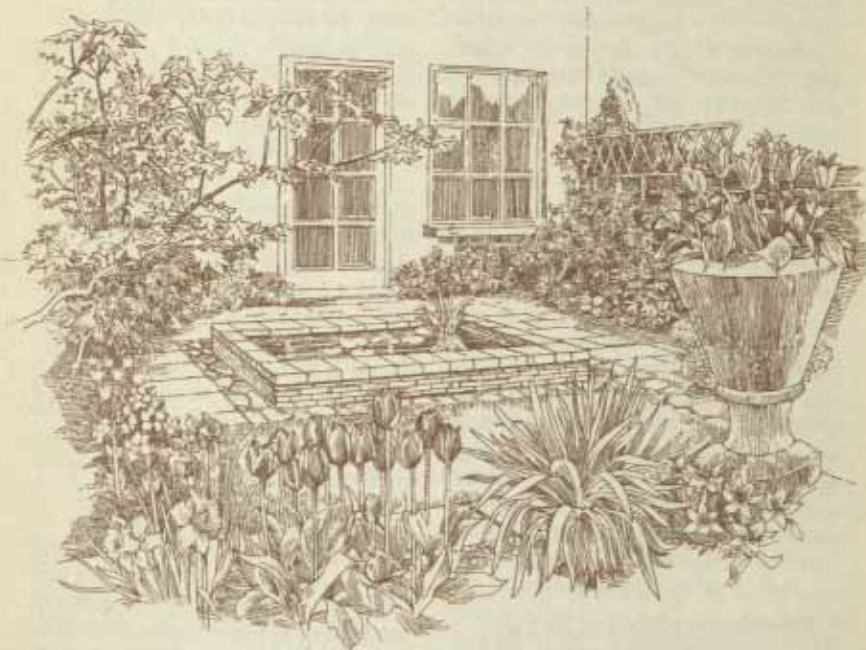
Woven board fencing, bamboo and lattice screening and trellis-work panels will do much to cover ugly walls or screen an unsightly view. Trellis work in a large mesh pattern of 9 by 12 in. or 12 by 15 in., and painted white, light blue or green, makes an attractive background and a good support for climbing plants, while trellis designed as a perspective screen makes the garden appear larger than it is.

If a tall, dense screen is wanted, and



#### BRIGHTENING A SMALL TERRACE

A small terrace can be given a warm and intimate character. Here, pots of brightly-coloured plants decorate the plain brick wall; the turn of flowers and the painted furniture can be rearranged to vary the site's appearance and to catch the sun. The trellis work fixed to the garden fence and covered with climbing plants such as Persian ivy will enclose the terrace and make it private



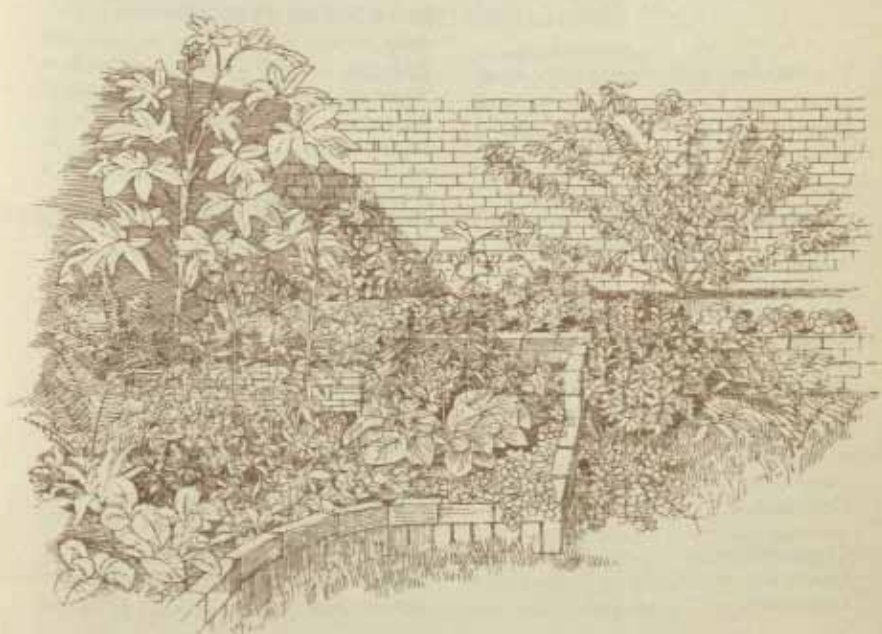
#### A BACK GARDEN WITH A POOL

In this garden a rectangular pool provides an interesting feature close to the house. The crazy paving immediately surrounding the pool relieves the severity of the regular paving stones and the stonework of the pool itself

#### FLOWER CONTRASTS IN RAISED BEDS

In constructing raised flower beds, the gardener can provide varying drainage and soil conditions, to allow a variety of plants to be grown together in a small area

TOWN GARDENS



only a narrow border is available, erect a high, wide-meshed lattice or trellis, and clothe it with a large-leaved vine or some other climber, such as *Clematis montana*.

Plants should also play their part as screening if the background is not to become too austere. Place shrubs or, if space permits, medium-sized trees at strategic points.

Recommended hedging shrubs for a screen are yew, holly, *Lonicera nitida*, *Pyracantha rogersiana* and golden privet. For a lower hedge, use English and Dutch lavenders, rosemary, *Berberis stenophylla* and box, and include one or two floribunda roses such as Frensham if a flower-

ing hedge is wanted. All these shrubs are also useful as partitions if the site is large enough to be divided into several small separate enclosures.

Ideally, borders should be 5 to 6 ft. wide if shrubs are to be planted in a single row, or about 8 ft. if planted in a double row at staggered intervals. If groups of hardy herbaceous flowers, such as campanulas, paeonies, Michaelmas daisies, *Pulsatilla vulgaris* and *bocconia* are planted between the shrubs, a border 8 to 9 ft. wide is advisable. The taller the shrubs are to grow, the wider should be the border. Choose simple outlines, for restricted space and the proximity of fences and walls do not allow much freedom in border planning.

## PLANTS FOR THE TOWN GARDEN

### SOME DEPENDABLE HERBACEOUS PLANTS

The following will tolerate quite shady corners, and may be planted in groups, preferably in threes or fives between or in front of shrubs.

Acanthus  
Aconitum  
Ajuga  
Alchemilla  
Anemone  
Anthericum  
Aquilegia  
Aruncus  
Asperula  
Aster  
Astilbe  
Bergenia  
Campanula  
Centranthus  
Chelone  
Chrysanthemum  
Dicentra  
Doronicum

Echinops  
Euphorbia  
Geranium  
Hemerocallis  
Heuchera  
Heucherella  
Hosta  
Iberis  
Iris  
Lupin  
Macleaya  
Mertensia  
Oenothera  
Paeony  
Penstemon  
Phlox  
Physostegia  
Polemonium  
Polygonum  
Pulmonaria  
Rudbeckia  
Salvia  
Scrophularia



Sedum  
Sidalcea  
Solidago  
Stachys  
Thalictrum  
Tradescantia  
Veronica

### BULBS AND BEDDING PLANTS

All the more common spring-flowering bulbs will thrive for at least two or three years in a town garden; the less sophisticated kinds, such as bluebell, Spanish bluebell, Star of Bethlehem, crocus, snowdrop, winter aconite, fritillary, grape hyacinth and narcissus, including daffodils, will continue to flower for many years if planted at random in borders and rough grass. Some of the tulips, such as *Tulipa kaufmanniana*, *T. fosteriana*, and *T. praestans* Fusilier will do well in any sunny corner, especially if left alone for a few years on top of a low retaining wall.

Later flowering bulbs that flourish in a town garden include such lilies as *Lilium candidum*, *L. hansonii*, *L. henryi*, *L. regale*, *L. speciosum*, *L. bulbiferum croceum* (syn. *L. aurantiacum*), *L. hollandicum*, and some of the new hybrids like Enchantment, Royal Gold and Golden Clarion. The summer-flowering hyacinth, *Galtonia candicans*, is both easy and decorative in a border among shrubs.

Bedding plants such as wallflower, forget-me-not, double daisy, pansy, sweet William, polyanthus, primrose, are invaluable for providing colour in the spring. There will be few casualties if all these are planted out in very early spring.

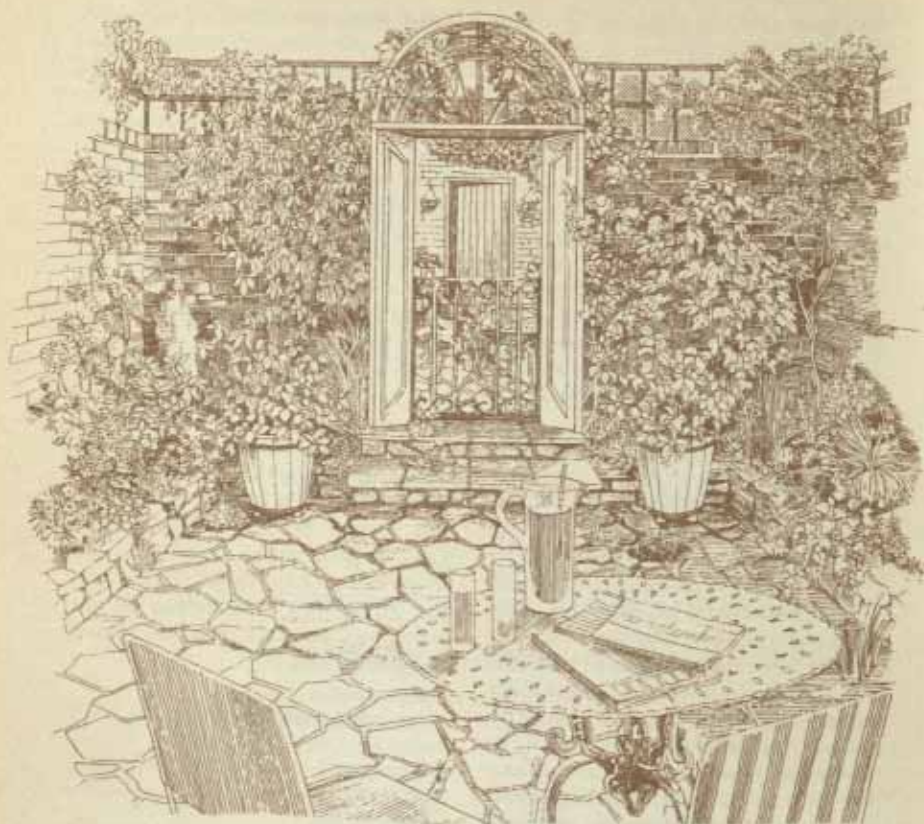
The only special care needed for summer bedding plants is to be sure that they have plenty of water if planted during a dry spell. Small decorative and pompon dahlias withstand town conditions admirably, as do begonias, and such annuals as tagetes, calendula and nemesia.

In a town, many bedding plants, including such common ones as polyanthus, coleus, heliotrope, begonia and *Bellis perennis* (daisy), are best bought from a reliable nurseryman or horticultural sundriesman. Buy and plant in the spring, but beware of plants that are available too early, for this means that they have been forced and will be unable to withstand outdoor conditions. Do not plant too early either, for young plants will immediately succumb to late frosts.

### FLOWERING SHRUBS AND EVERGREENS

Many shrubs described in *Shrubs and Trees* and other chapters in this book can adapt themselves to town conditions, and those listed below are particularly suitable. Sponge the leaves of evergreens like rhododendrons, camellias and sweet bay occasionally to remove soot and grime. For a description of the general care and cultivation of all shrubs, see *Shrubs and Trees*.

*Arundinaria nitida* (bamboo)  
*Aucuba japonica* (spotted laurel)  
*Berberis*  
*Buddleia davidii*  
*Buxus sempervirens*  
*Camellia japonica*  
*Ceanothus* Gloire de Versailles  
*Chaenomeles japonica*  
*Cornus alba spaethii* (dogwood)  
*Cotoneaster*  
*Daphne mezereum*  
*Deutzia scabra*  
*Elaeagnus pungens aureo-variegata*  
*Euonymus japonicus*  
*Fatsyhedera lizei*  
*Fatsia japonica* (castor oil tree)  
*Forsythia*  
*Fuchsia magellanica*  
*Hebe*  
*Hydrangea macrophylla*  
*Hypericum calycinum* (rose of Sharon)  
*Ilex aquifolium* (holly)  
*Kerria japonica* (jew's mallow)  
*Laurus nobilis* (sweet bay)



## ILLUSIONS WITH A MIRROR

To achieve an impression of spaciousness, a mirror has been fixed to the end wall of this small courtyard. Wing panels have mouldings that give a false perspective, and a wrought-iron gate in front of the mirror adds realism to the scene

*Lavandula* (lavender)  
*Leycesteria formosa*  
*Ligustrum* (privet)  
*Mahonia aquifolium*  
*Olearia haastii* (New Zealand daisy)  
*Philadelphus* (mock orange)  
*Prunus laurocerasus* (common laurel)  
*P. lusitanica* (Portugal laurel)  
*Pyracantha* (fire thorn)  
*Rhododendron* hybrids  
*Rhus typhina laciniata* (stag's horn sumach)  
*Ribes* (flowering currant)

*Rosmarinus* (rosemary)  
*Senecio laxifolius*  
*Skimmia*  
*Spiraea*  
*Syringa* (lilac)  
*Taxus* (yew)  
*Viburnum*  
*Weigela*

In addition to these plants, the following shrubs are also particularly suitable for growing in town gardens:

*Danae racemosa* (Alexandrian laurel), evergreen, 3 to 4 ft., small yellow flowers and red fruit. Plant in autumn. Thrives in semi-shade and under trees.

*Eriobotrya japonica* (loquat), a bold and distinguished-looking evergreen, up to 20 ft. The glossy dark green leaves are corrugated, and about 1 ft. long and 4 to 5 in. wide. Fragrant yellowish flowers; rarely bears fruit in the British Isles. Plant in October or April. Prune in April. It needs a mild winter to do well.

*Osmanthus ilicifolius* (syn. *O. aquifolium*), a useful evergreen, 10 to 12 ft., with holly-like leaves. Fragrant white flowers in September. Plant in October or April. Very slow growing.

*Symphoricarpos* (snowberry). Deciduous, up to 8 ft. Untidy in growth, but will often thrive where all else fails. Pink flowers in July are followed by berries in winter, which persist after the leaves have fallen. Plant from October to February.

*S. albus laevigatus*, has white berries.

*S. orbiculatus* (coral berry), pink berries.

*S. chenaultii*, has rose-purple fruits and is a good plant for bees.

*Yucca*. A very striking evergreen to be used in strategic positions but only in large gardens. Tall, flowering spikes bearing creamy-white flowers in August rise from the rosette of sword-like leaves. Plant in October or April. *Y. filamentosa* (Adam's needle) has leaves about 2½ ft. long and 1 to 2 in. wide; the flower spikes rise to 5 ft. *Y. recurvifolia* has narrower leaves, which are softer, and therefore curve back; the flower spikes are about 4 ft. tall.

## PLANTS FOR WALLS AND FENCES

showing favoured aspects

*Aristolochia macrophylla*, east.

*Buddleia alternifolia*, south and west.

*B. davidii* varieties, south and west.

*Camellia*, north.

*Campsis radicans*, south and west.

*Ceanothus* Autumnal Blue, south and west.

*C. Delight*, south and west.

*C. Gloire de Versailles*, south and west.

*C. veitchianus*, south and west.

*Chaenomeles* Knaphill Scarlet, north and east.

*C. loganaria cardinalis* (syn. *C. umbilicata*), north and east.

*C. nivalis*, north and east.

*Chimonanthus praecox*, east.

*Clematis alpina*, north.

*C. montana*, north.

*C. m. rubens*, north.

*Clematis armandii*, south and west.

*C. flammula*, south and west.

*C. macropetala*, south and west.

*C. tangutica*, and large-flowered hybrids, south and west.

*Cotoneaster cornubia*, north and east.

*C. horizontalis*, north and east.

*C. lactea*, north and east.

*Cytisus battandieri*, south and west.

*Eccremocarpus scaber*, south and west.

*Euonymus radicans variegata*, north and east.

*Forsythia suspensa*, north and east.

*Garrya elliptica*, north and east.

*Hedera canariensis variegata*, north and east.

*H. colchica dentata aurea*, north and east.

*H. hibernica*, north and east.

*Hydrangea petiolaris*, north and east.

*Jasminum nudiflorum*, north and east.

*J. officinale*, east.

*J. polyanthum*, south and west.

*Kerria japonica flore pleno*, east.

*Lonicera americana* (syn. *L. grata*), north and east.

*L. fragrantissima*, north and east.

*L. halliana*, east.

*L. japonica aureo-reticulata*, north and east.

*L. periclymenum belgica*, north and east.

*L. tellmanniana*, south and west.

*Magnolia grandiflora* Exmouth, south and west.

*M. g. Goliath*, south and west.

Morello cherry, north.

*Passiflora caerulea*, south and west.

*P. Constance Elliott*, south and west.

*Polygonum baldschuanicum*, north.

*Prunus triloba flore pleno*, south and west.

*Pyracantha atalantoides* (syn. *P. gibbsii*), north and east.

*P. coccinea*, north and east.

*P. rogersiana*, north and east.

*Rosa* William Allen Richardson, south and west.



## TOWN GARDENS

R. Caroline Testout, north and east.  
 R. Danse de Feu, north and east.  
 R. Gloire de Dijon, north and east.  
 R. Golden Showers, north and east.  
 R. Mme. Alfred Carrière, north and east.  
 R. Mme. Gregoire Staechelin, north and east.  
 R. Emily Gray, east.  
 R. New Dawn, east.  
 R. Paul's Scarlet, east.  
 R. Mermaid, all.  
*Solanum crispum* Glasnevin, south and west.  
*Vitis coignetiae*, north and east.  
*V. henryana*, north.  
*V. vinifera* Brandt, south and west.  
*V. v. purpurea*, south and west.  
*Wisteria sinensis*, south and west.  
*W. venusta*, south and west.

## TREES FOR THE TOWN GARDEN

*Acer ginnala*  
*A. negundo variegatum*  
*Amelanchier canadensis*  
*Catalpa bignonioides*  
*C. b. aurea*  
*Crataegus oxyacantha*  
*Gleditsia triacanthos*  
*Laburnum vossii*  
*Magnolia denudata*  
*M. kobus*  
*M. sieboldii*  
*M. soulangeana*  
*Morus nigra*  
*Prunus avium flore pleno*  
*P. blireiana*  
*P. cerasifera atropurpurea* (syn. *P. pissardii*)  
*P. persica* (peach)  
*P. sieboldii*  
*P. serrulata* Amanogawa  
*P.s. Fugenzo* (syn. *P.s. James H. Veitch*)  
*P.s. Shirofugen*  
*P.s. Hokusai*  
*P.s. Kojima*  
*P.s. Tai Haku*  
*P. yedoensis*  
*Robinia pseudoacacia*  
*Sophora japonica*  
*Sorbus aria lutescens*  
*S. aucuparia*  
*S. commixta*  
*S. decora*

*S. discolor*  
*S. esserteauiana* (syn. *S. conradinae*)  
*S. majestica*  
*S. vilmarinii*

## PLANTS FOR GROUND COVER

The town garden has many problem spots such as shady places below walls and under trees, where the soil is poor and root-ridden; wet spots and dry spots; and banks and slopes where grass will not grow. If neglected, these corners will soon become weed-infested. Ground-cover plants are therefore invaluable. The following are some of the more reliable and decorative varieties:

*Arundinaria vagans* (dwarf bamboo), 1½ to 3 ft., very rapidly spreading, will tolerate shade. Plant in April or May.

*Bergenia cordifolia* (elephant ear), 9 in. Large heart-shaped leaves that remain dark green in winter; reddish flowers in March. Will flourish in sun or shade, and in almost any soil; successfully chokes all weeds. Plant in October or April.

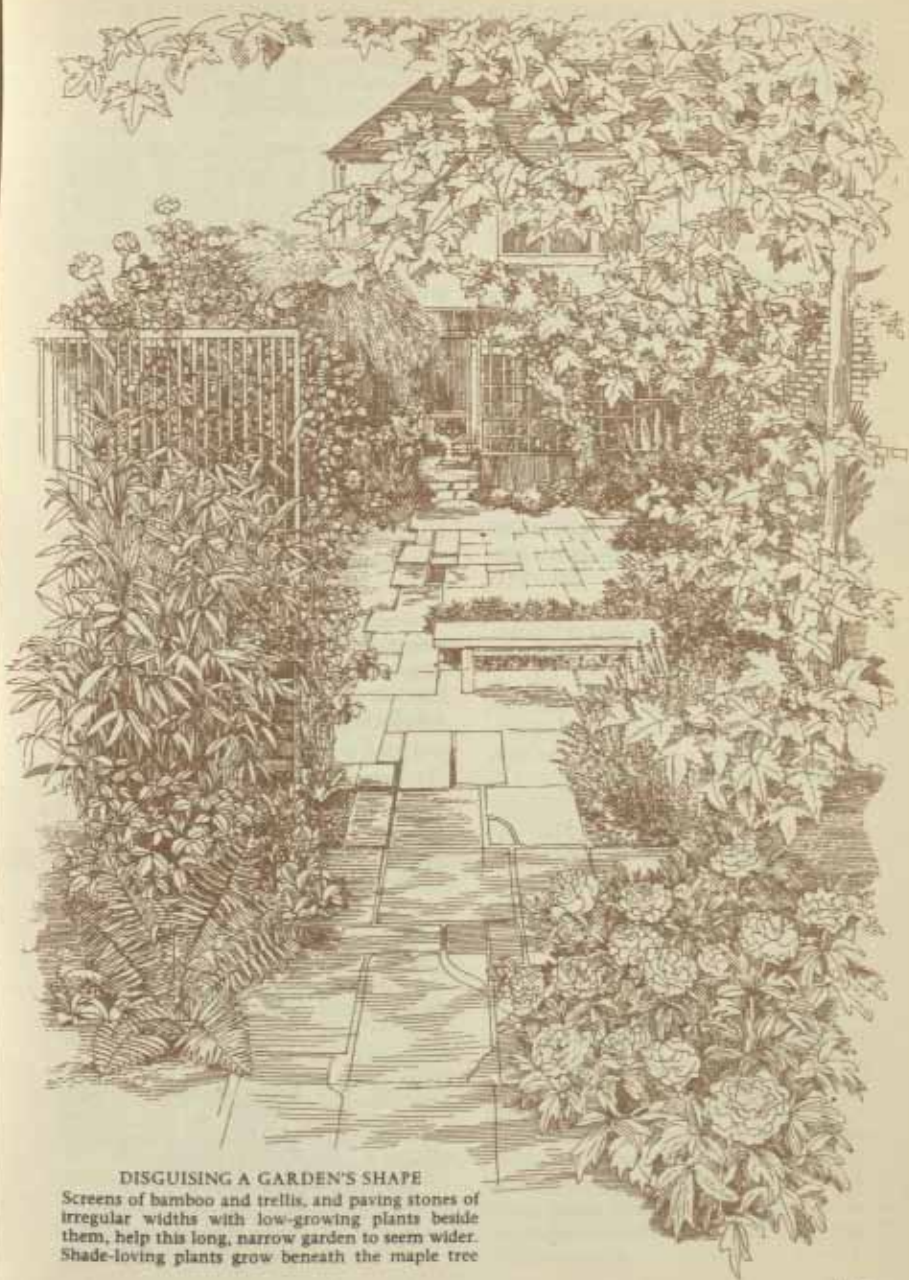
*Convallaria majalis* (lily-of-the-valley), creeping; fragrant, white, bell-shaped flowers in spring. Thrives in shade and moisture; spreads quickly once crowns are established. Fortin's Giant is the best variety. Plant crowns in November, 3 in. deep and 6 in. apart.

*Cotoneaster conspicua decora*, prostrate evergreen; small leaves; white flowers in June; red fruits last for most of winter. Grows vigorously; excellent for a low bank. Plant in October to February 3 ft. apart.

*C. dammeri*, prostrate, creeping evergreen; white flowers in June; coral fruit. Useful for banks or overhanging rocks. Plant in October to February 2 ft. apart.

*C. horizontalis*, deciduous; distinctive herring-bone branching that spreads horizontally and only slowly upward; pinkish flowers in May, bright red fruit, colourful leaves in autumn. Will thrive in quite inhospitable conditions, but likes sun. Plant in October to February.

*Epimedium grandiflorum*, 8 to 15 in. Leaves turn a rich bronze in autumn; white,



DISGUISED A GARDEN'S SHAPE

Screens of bamboo and trellis, and paving stones of irregular widths with low-growing plants beside them, help this long, narrow garden to seem wider. Shade-loving plants grow beneath the maple tree

yellow, deep rose or violet flowers from spring to summer. Excellent ground cover in either sunny or shady positions. Plant in October.

*E. pinnatum*, 8 to 15 in., has bright yellow flowers in summer. Makes excellent ground cover in either sunny or shady positions. Plant in October.

*Euonymus radicans variegatus*, 1 ft., creeping evergreen; small, toothed leaves edged with white; flowers insignificant, but attractive pink fruit. If set 1 ft. apart, the plants will soon knit together to form a dense carpet; hardy. Plant in October or March.

*Galax aphylla*, 3 to 6 in; evergreen, perennial; shiny, heart-shaped leaves turn bronze in winter; white flowers in June. Likes moist, peaty soil, and shade; hardy. Plant in October to March.

*Hedera helix* (ivy), evergreen; lobed leaves; choose the small-leaved and variegated forms for ground cover. Very hardy. Plant in April.

*Hosta* (plantain lily), 1½ to 2½ ft.; perennial; luxuriant foliage; small flowers, usually lilac-coloured, from July to September; likes shade and moisture; hardy; will effectively smother all weeds. *H. fortunei* and *H. sieboldiana* are the best. Plant in October or March.

*Hypericum calycinum* (rose of Sharon), about 1 ft.; semi-evergreen; leathery leaves; yellow flowers from June to September. Very vigorous and hardy; will tolerate dry soil; clip in spring to keep in good condition. Plant in October to March.

*Iberis sempervirens* (candytuft), about 9 in.; evergreen; dense foliage; white flowers in spring and summer. Hardy and thrives in town conditions. Plant from March to May.

*Lamium galeobdolon variegatum* (variegated yellow archangel), 1 to 1½ ft.; trailing perennial; slender, silvered leaves; yellow flowers in summer. Effective for ground cover under shrubs; likes shade and a light soil. Plant in October or March.

*L. maculatum* (dead nettle), 4 to 7 in.; perennial; green leaves with white stripe; insignificant purple flowers in summer. Will thrive in the most difficult places. Plant in October or March.

*Mahonia aquifolium* (Oregon grape), 3 to 4 ft., but can be kept low by clipping; evergreen; the shiny leaves turn orange in autumn; fragrant golden flowers in late winter and early spring. Will tolerate shade, drips from overhanging trees and indifferent soil. Plant in April.

*Pachysandra terminalis*, up to 1 ft.; evergreen; oval, toothed leaves; insignificant greenish-white flowers in April. Thrives in shade, even under trees. Plant in November to February.

*Polygonatum multiflorum* (Solomon's seal), 2 to 4 ft. Elongated, curving leaves; pendulous white flowers in June; bluish-black fruit. Thrives in shade and any type of soil; excellent ground cover in a town garden. Plant in October or March.

*Sarcococca humilis*, 1 to 1½ ft.; dwarf, tufted evergreen; glossy, pointed leaves; white, fragrant flowers from January to March; black fruit. Likes shade and a well-drained soil. Plant in April.

*Tellima grandiflora*, about 2 ft.; perennial; the heart-shaped leaves turn crimson in autumn; attractive greenish flowers from April to June. Hardy; grows slowly but thickly and does well under shrubs. Plant in October or March.

*Vinca major* and *V. minor* (periwinkle), prostrate, trailing perennial; ovate leaves; bluish-purple flowers in April and May. Excellent ground cover for banks and shady places; will tolerate all but the poorest soils. The variegated forms are attractive. Plant in April.

Ferns also make excellent ground cover, and are effective for leaf contrast as well. As long as the soil is reasonably moist, the following are reliable:

*Athyrium filix-femina* (lady fern)

*Dryopteris filix-mas* (male fern)

*Phyllitis scolopendrium* (hart's tongue fern)



## TUBS

Tubs, large pots and vases are now frequently used to decorate a paved terrace adjoining the house, or for growing plants where soil conditions are unfavourable. The position of the containers can be rearranged during the year to produce new effects.

## PREPARATION

Although tubs of oak, teak or stone are available ready for planting, less expensive and equally effective ones can be made from large wine casks sawn in half. Treat the inside of each tub with Cuprinol, bore holes in the bottom for drainage, and fix castors underneath for easy movement. If castors are not used, stand the tubs on bricks or wooden blocks to ensure drainage and aeration. Paint the outside of the tubs.

When the tubs are in position, put a 2- or 3-in. layer of crocks in the bottom of each, add some chopped turves, and fill with John Innes potting compost No. 2. Be sure to use only good soil in tubs. Give the compost a good soaking and allow it to drain before planting.

## MAINTENANCE

Regular watering is essential for all plants in tubs, together with a fortnightly dose of liquid manure during the growing season. Once a year, remove the top 2 or 3 in. of soil, and replace it with a fresh mixture, preferably John Innes potting compost No. 2 mixed with peat, some vermiculite, which helps to retain moisture, and a handful of fine bone meal. Make sure that the drainage is adequate, that all brackets and bands are sound, and that the castors work easily. Give the tubs a coat of paint to freshen them up for a new season.

The following plants are recommended for cultivation in tubs:

## SPRING-FLOWERING

Forget-me-not  
Muscari  
Narcissus  
Polyanthus  
Wallflower  
Tulip

## SUMMER-FLOWERING

*Agapanthus umbellatus*  
*A. campanulatus* (syn. *A. umbellatus mooreanus*)  
Begonia  
Catmint  
Fuchsia  
Geranium  
Heliotrope  
Lilies such as *Lilium regale*, *L. speciosum*  
Marguerite  
Nicotiana  
Pelargonium  
Petunia  
Salvia  
Tropaeolum (nasturtium)  
Verbena

## SHRUBS

*Acer palmatum* (Japanese maple)  
Box  
*Camellia japonica*, *C. williamsii* Donation  
*Chaenomeles japonica*  
*Chamaecyparis* (dwarf)  
*Forsythia ovata*  
F. Lynwood  
Fuchsia  
Hydrangea  
Juniper (dwarf)  
*Laurus nobilis* (sweet bay)  
Malus  
*Prunus*. Among the *Prunus* that can be grown in tubs are dwarf Japanese cherries; trained eating cherries; almonds, including the dwarf Russian almond; nectarines; and peaches, such as Peregrine and Hale's Early.  
Pyrus (dwarf, trained pears)  
Rhododendron  
Rosemary  
Strawberries  
*Viburnum carlesii*



PLANTS IN TUBS

In small gardens, where space is limited, tub-grown plants are useful because they can be moved about when change is desired. Here, a Japanese maple, trained as a standard, grows in a cut-down barrel. The other tub contains begonias, pelargoniums (geraniums) and petunias

## SINK GARDENS

The increasing use of stone troughs and sinks as containers for growing plants has made it possible to create most effective miniature gardens. Old stone sinks are no longer easy to find, especially in the southern part of the British Isles, but an old wash basin or concrete container makes a very good alternative.

One of the most important things to consider is drainage, particularly in a town garden where the trough is likely to be situated under a tree. For full details of drainage and soil for a sink garden see *Rock Garden Construction*.

Planning and planting the sink garden is primarily a matter of taste, but the best foundation is a miniature rocky landscape with the semblance of an alpine meadow or a scree, broken at intervals by rocks and tiny trees such as the pygmy Scots pine, or a dwarf cypress or juniper.

A few spreading plants on the upper levels will give the miniature landscape a windswept appearance, while one or two trailing plants at the edge of the sink will enhance the proportion and soften any hard lines.

The contours of the sink garden, and indeed its whole appearance, can be changed at will, simply by moving a few stones. To maintain a natural effect be sure to use stones of proportionate size and of the same kind. If the strata show in the stones make sure they all run in the same direction.

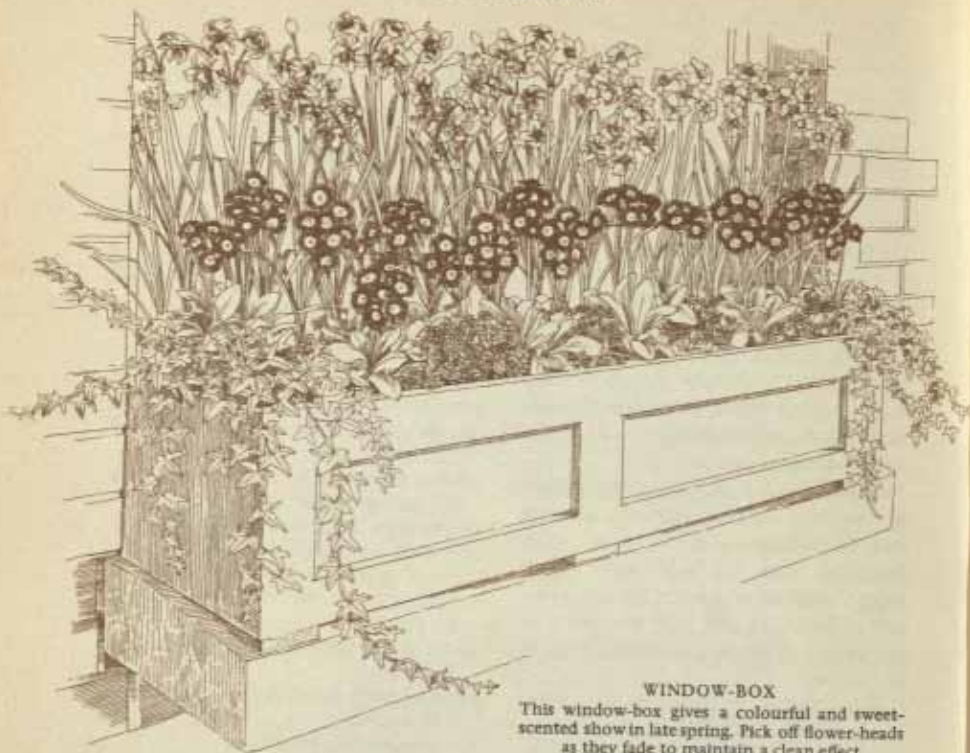
A whole range of alpine is available for use in the sink garden, though it is advisable to master the easier ones first, for this is a specialized form of alpine gardening which requires skill and careful attention.

## EASY ALPINES FOR THE SINK GARDEN

- Aethionema* Warley Rose, rose-red, June.
- Androsace sempervivoides*, deep pink, May.
- Arenaria purpurascens*, purplish, June and July.
- Armeria caespitosa*, rose-red, April onward.
- Campanula cochlearifolia* (syn. *C. pusilla*), blue or white, June to August.
- C. pulla*, violet-blue, June.
- Dianthus microlepis*, pink or white, June and July.
- Draba aizoon*, yellow, April.
- Erigeron uniflorus*, white or purple, July and August.
- Erodium chamaedryoides roseum*, deep pink, July to September.
- Helianthemum*, wide variety, May onward.
- Hypericum reptans*, golden-yellow, tinged red, August to October.
- Iberis saxatilis*, white, tinged purple, May to July.
- Linaria alpina*, lavender and gold, July to September.
- Limn. salicoides nanum*, white, tinged pink, June and July.
- Morisia monantha*, gold, May.
- Penstemon roezlii*, pale or dark blue, July.
- Potentilla verna nana*, yellow, May and June.
- Raoulia australis*, pale yellow, July.
- Rosa Oakington Ruby*, ruby-crimson, June to September.
- R. Roulettii*, rose-pink, June to September.
- Saxifraga irvingii*, pale lilac-pink, April.
- S. oppositifolia*, rose-red, March and April.
- Sedum*, white, yellow or red, June to September.
- Thymus serpyllum*, purple, white, pink or red, June.

Miniature bulbs may also be grown in a sink garden, including crocus species, miniature narcissus, scilla, dwarf iris, grape hyacinth, and several of the smaller tulip species.





WINDOW-BOX

This window-box gives a colourful and sweet-scented show in late spring. Pick off flower-heads as they fade to maintain a clean effect

## WINDOW-BOXES

For the town dweller who would like to have a garden but lacks the space, a window-box provides a solution and the opportunity to indulge in some of the pleasures of gardening while being spared many of its problems. Window-box gardening is a compromise between the indoor pot plant and the outdoor garden border, but it still requires skill and care to bring plants to perfection. This is an instructive and entertaining form of gardening, resulting in a gay and colourful adornment for a house.

### MATERIALS AND SIZE OF BOX

The size and shape of the windows, the dimension of the sills, and the architectural style of the house itself will determine the type of window-box to use. Though available with handles, window-boxes are best regarded as a permanent fixture.

Red cedar, teak, oak and elm are the best woods for window-boxes, in that order, while other suitable materials are concrete, cement, artificial stone, metal or plastic. An artificial stone box can be

quite effective, especially if the outer face is moulded to accord with the design of the house front, and some metal ones are most decorative as well as practical.

Before painting any of these surfaces, apply an initial coat of sealing or priming paint as used for asbestos cement. Make sure that the material is quite dry and free from dust before painting. Wooden boxes require three coats of paint a year and the inside of the box should be treated with a preservative like green Cuprinol: about  $\frac{3}{4}$  pt. will be sufficient for a box 3 ft. long and 9 in. deep. This is harmless to plant-roots once it has dried, and will give good protection for at least three or four years.

Better still, line the box with light metal or zinc, which will both prolong the life of the wood and retain moisture in the soil.

Stone and concrete boxes are generally available in standard patterns, from 2 to 4 ft. long, about 8 in. deep,  $7\frac{1}{2}$  in. wide at the base and slightly wider at the top.

### FIXING THE BOX

Place blocks of wood under the window-box to keep it clear of the sill and fix the box securely by driving wedges between the ends of the box and the side walls, or, better still, by attaching it with hooks to eyelets in the window frame.

If the box is hung under the window-sill or fixed on a wall, use stout wall-brackets attached to the wall by Rawl-plugs and 2-in. screws.

As an additional safeguard, a chain can be placed round the front of the box and fixed to hooks in the wall.

Use heavy-gauge galvanized straps to attach a box to a balcony railing, allowing one strap for each foot of box. If set on top of a brick wall or balcony, anchor the box with steel dowel pins set in the brickwork, again allowing one pin to every foot of box.

### FILLING THE BOX

When the box is in position, spread a 2-in. layer of crocks in the bottom, placing one large piece over each drainage hole. Add a few pieces of charcoal to keep the soil sweet, and a layer of sphagnum moss, with some chopped turves and leaves. Then fill the box with really good soil, planting at the same time and finishing with the soil level and about 1 in. from the top.

Although a good compost can be made from a mixture of three parts loam, one part peat and one part sharp sand, all put through a fine sieve, it is easier, if a little more expensive, to use John Innes potting compost No. 2, which is available from horticultural sundriesmen. Never economize on the soil-filling for window-boxes.

Plant bulbs and other spring-flowering plants in September or October. When these have finished flowering they can immediately be replaced by summer-flowering plants.

When arranging the plants, make sure that the effect will be bright without being garish by aiming for harmonious effects rather than contrasts. Grey foliage always makes an effective foil for colour.

### MAINTENANCE

Since a window-box has only a limited soil capacity, is exposed to wind and sun, and often sheltered from rain by overhanging eaves and other projections, it tends to dry out rather quickly. Regular watering is therefore necessary. Although the exact frequency of watering depends on the aspect and position, a good soaking every three or four days, preferably in the evening, is generally sufficient to keep the soil moist. Do not flood the box. A dose of weak liquid manure once a fortnight during the summer is a good stimulant to growth. Always water before feeding, as liquid feed is harmful when applied to dry soil.

Stir the soil between the plants occasionally with a pointed stick or old kitchen fork to prevent the formation of a hard crust. When the plants are removed at the end of every spring and summer season, fork over the compost lightly, and give a dressing of fine bone meal or general fertilizer.

If possible, change the soil completely during the winter.

## RECOMMENDED PLANTS

*showing favoured aspects*

- Ageratum*, blue, June to September, south and west.  
*Alyssum*, yellow or white, April and May, all except north.  
*Antirrhinum*, usually yellow or red or pink, sometimes two-coloured, June to October, all except north.  
*Arabis*, white, or pink, purple-blue, March to August, all except north.  
*Aubrieta*, lilac to purple, April and May, all.  
*Auricula*, multi-coloured, various combinations, March to May, all.  
*Begonia*, white, pink, scarlet or yellow, July to September, all except north.  
*Bellis perennis* (double daisy), white, pink or red, May and June, all.  
*Calceolaria*, yellow, often marked with red or purple, June to September, south and west.  
*Calendula*, orange or yellow, June onward, all except north.  
*Campanula carpatica*, blue, June to August, south and west.  
*Canna*, usually yellow and/or red, May to August, south and west.  
*Celestia cristata*, dark red, June to September, south and west.  
*Centaurea moschata* (sweet sultan), white, yellow or purple, June to September, all except north.  
*China aster*, various, August to October, south and west.  
*Chionodoxa*, blue, pink or white, March and April, all.  
*Chrysanthemum* (pompon and Korean), various, August and September, all except north.

- Coleus*, white, blue, purple, October, south and west.  
*Convolvulus tricolor*, blue, pink or white, July to September, south and west.  
*Crocus*, usually white, blue, yellow, orange or purple, February to April, all.  
*Dahlia* (single bedding varieties), usually scarlet or yellow, August and September, all except north.  
*Dianthus*, usually red, pink or white, July to September, south and west.  
*Fuchsia*, reds, pinks and purple, July to September, south and west.  
*Gazania*, yellow or orange, June to August, south and west.  
*Geranium*, usually white, pink, red, purple or blue, June to August, all.  
*Heliotrope*, blue or white, May to September, south and west.  
*Hyacinth*, various, usually pink, white, blue or yellow, March and April, all except north.  
*Kochia*, green or red, July and August, south and west.  
*Lobelia*, blue or red, May to September, all.  
*Lysimachia nummularia* (creeping Jenny), bright yellow, June to August, all.  
*Marguerite*, white or yellow, June to August, all except north.  
*Mesembryanthemum*, white, yellow, pink, red or purple, June to August, south and west.  
*Mignonette*, white, June to September, all except north.  
*Myosotis palustris* (forget-me-not), blue, white or pink, May and June, all.  
*Narcissus*, white or yellow, March to May, all.  
*Nemesia*, yellow, white, violet, red or blue, July to September, south and west.  
*Pansy*, various, mixed, March to May, all.  
*Pelargonium*, pink, red, purple, white, June to August, all except north.  
*Petunia*, various, July to September, south and west.  
*Phlox drummondii*, red or mauve, July onward, south and west.  
*Polyanthus*, various, from white to deep purple, March to May, all.  
*Primrose*, yellow, March and April, all.



## TOWN GARDENS

Rose (miniature varieties), various, June to September, all.

*Salvia* Blaze of Fire, scarlet, July, south and west.

*S. patens*, blue, September, south and west.

*Saxifraga umbrosa* (London pride), pink, May and June, all.

Scilla, blue or purple, March to May, all.

Stock, white, pink, red or purple, July to September, all except north.

Sweet William, various, often two-coloured, May and June, all except north.

Tagetes, yellow or orange, July and August, all except north.

*Tropaeolum majus* (nasturtium), white, yellow, orange, red or purple, June to September, all except north.

Tulip, various, often yellow, pink, red or white, April and May, all except north.

*Verbena hybrida*, blue, purple, pink, red, yellow, or white, June to October, south and west.

Viola, usually white or purple, February to April, all.

Wallflower, white, red, yellow, orange or pink, April and May, all except north.

Wallflower, Siberian, orange, April to June, south and east.

Zinnia, yellow, red, pink or purple, July to October, south and west.

Greenhouse plants such as calceolarias, cinerarias, and certain primulas including *P. malacoides* and *P. sinensis*, as well as dwarf Japanese azaleas, may be planted out in window-boxes in early May, just before they flower.

This practice cannot be relied upon to produce a display, however, as late frosts may damage the plants.

### CLIMBING PLANTS

The following plants can be used to frame the window and its window-box:

*Clematis jackmannii*

*C. Mme. le Coultre*

*C. Nelly Moser*

*C. Royal Velours*

*Hedera helix* (variegated forms)

*Ipomoea* (morning glory)

*Jasminum nudiflorum*

*Lonicera japonica aureo-reticulata*

Sweet pea

*Vitis henryana*

*V. vinifera purpurea*

## WINTER SHRUBS

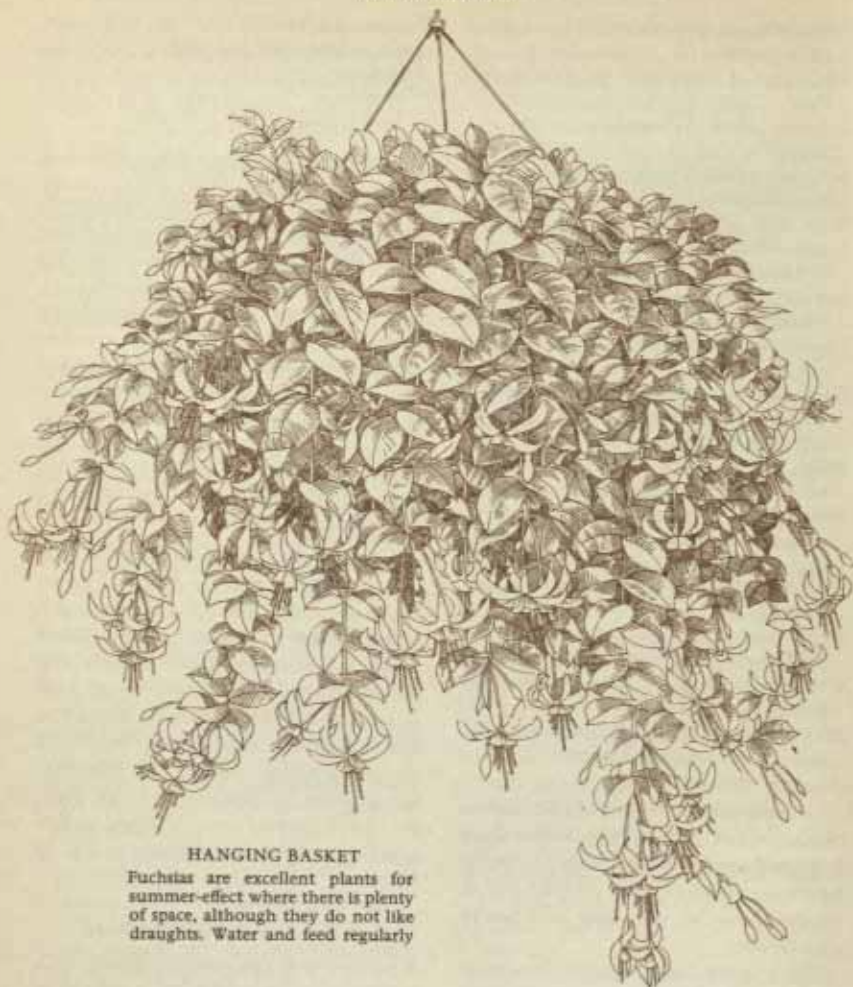
In hospitable conditions, wallflowers planted out in the autumn will remain green throughout the winter. The only thoroughly reliable plants for a window-box in winter, however, are dwarf evergreen shrubs. Even these are not completely satisfactory, for few people can afford to discard these fairly expensive plants at the end of the winter; on the other hand, if they remain in the window-box, some of the spring and summer flower display will have to be sacrificed.

It is possible to compromise by mixing such spring bulbs as crocus, grape hyacinth, scilla, daffodil and tulip, with a few dwarf evergreen shrubs. These could include box, dwarf juniper and dwarf chamaecyparis. *Erica carnea* produces an excellent flowering display in late winter and early spring, especially the varieties King George, Vivelli, Springwood White, and Springwood Pink. *Santolina chamaecyparissus* (syn. *S. incana*) and *S. neapolitana* will thrive if facing south or west.

## A WINDOW HERB GARDEN

A window-box can combine beauty with utility if planted with a few herbs. They are not difficult to grow, and although less showy than bedding plants, they are nevertheless quite decorative.

Grow parsley from spring-sown seed, as well as lemon and common thyme, chives, mint and marjoram. The blue flowers of borage look most attractive hanging over the side of the box; balm and bergamot like moisture and a little shade.



HANGING BASKET

Fuchsias are excellent plants for summer-effect where there is plenty of space, although they do not like draughts. Water and feed regularly

## HANGING BASKETS

A hanging basket is a simple but extremely picturesque way of decorating a porch with summer-flowering plants.

Remember, though, to hang baskets where they will not obscure the light, and make sure they are high enough to prevent them from being knocked.

### SIZE AND MATERIALS

Hanging baskets should be 12 to 18 in. in diameter and 6 to 9 in. deep.

The larger the basket, the better the effect; avoid designs with a diameter of less than 12 in. as they are too small to hold sufficient soil.

Baskets are generally made of stout galvanized wire in an open-weave design and lined with black polythene, through which several holes have been punched. It is also possible to obtain baskets made entirely of Alkathene and fitted with a special drainage device.

### FILLING THE BASKET

Place the basket on top of a large flower pot or bucket to hold it steady, and line it thickly with fresh, damp moss. If available, add a very small quantity of turves and peat, which will help to retain moisture. Then fill with John Innes potting compost No. 2.

Insert the plants before the basket is full of compost, and firm well round the roots with the fingers.

A 12-in. basket will hold three plants from 5-in. pots, together with three or more smaller trailing plants between these and round the edge of the basket. Seeds of nasturtiums or small, rooted lobelias or coleus can be tucked through the sides of the basket.

Leave a shallow depression in the centre of each basket to collect water, and when planting is completed, soak the basket thoroughly by immersing it in a bath or tub of water. Allow surplus water to drain off before hanging up the basket.

Do not hang baskets out-of-doors until all fear of frost is past, usually by the beginning of June.

### MAINTENANCE

When the basket needs watering, always immerse it rather than water overhead with a can. Add a teaspoonful of liquid manure to each gallon of water once a fortnight during the growing season, and remove any withered flowers at the same time. Spray or wipe the foliage occasionally to keep it clean.

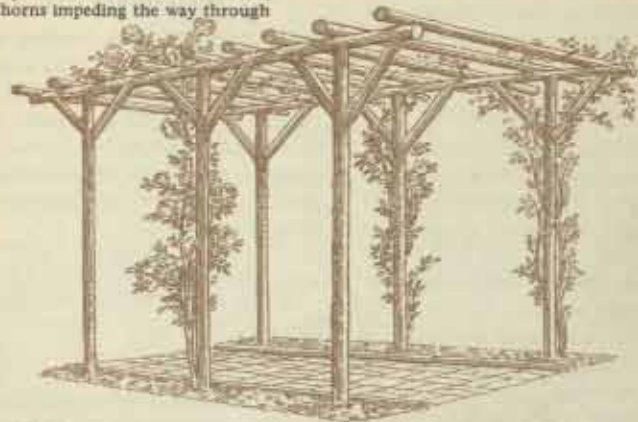
### SUGGESTED PLANTS FOR A HANGING BASKET

Begonia  
Calceolaria  
*Campanula isophylla*  
Coleus. Invaluable for foliage effects.  
Fuchsia, especially the pendulous varieties such as *F. Cascade* and *F. Marinka*.  
Heliotrope  
Lobelia (trailing varieties)  
Marguerite  
Nasturtium  
Petunia  
Pelargonium (geranium). Use the ivy-leaved varieties for draping the sides of the basket, and the upright zonal kinds for filling the top.  
Verbena (dwarf and trailing varieties)  
*Zebrina pendula* (syn. *Tradescantia zebrina*)  
(wandering jew)





A simply-made pergola of natural larch, ideal for growing climbing roses. A rose arch should never be less than 6 ft. wide or the plants will become a nuisance, their thorns impeding the way through.

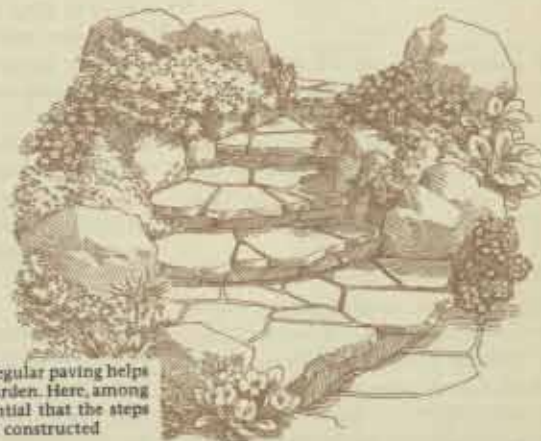


Leave room for small plants when setting trees or posts in paving.



Trailing plants will enhance the appearance of walls. They are easy to establish if suitable holes or gaps are left in the stonework. Be sure that there is plenty of soil at the back of the wall into which the roots can penetrate. It is easier to leave these gaps in dry wall construction, and the plants can be inserted as each course is built up; pot-grown plants are the most suitable as they already have a good root ball.

Cobbles can, with some patient planning, be set in charming patterns. Make the main shape first with larger cobbles, and fill in the pattern with smaller ones.



A winding flight of steps of irregular paving helps the "natural" look of a rock garden. Here, among jagged-edged rocks, it is essential that the steps should be safe and well constructed.

## Garden Construction

LONG before a spade is actually put in the soil, garden construction should begin with an appraisal of the site's shape, size, soil and contours and a plan of how best to use them.

Every new garden can be treated in a variety of ways. The aim of any design and construction work should be to make the garden "live": to make it blend with existing features and the house that it will frame, and to give it a personality in its own right—although always a relaxing one.

A mistake made in many gardens is overcrowding; too many effects and features are crammed into a confined

space and so give an irritating and unsettling effect. To help avoid this error, it is worth while making a scale plan of the garden on graph paper before creating or redeveloping a site so that the juxtaposition of features can be worked out in advance.

### PRELIMINARY PLANS

It is impracticable to suggest designs for gardens in general since gardens vary enormously in shape and size, and design is so much a matter of taste. But there are certain basic rules which should be observed in planning the design of a new garden.

### OUTLOOK

It is important that a garden should look attractive from the house and, as a general rule, the more formal features should be those that are close to it. Pleasant lawns and borders should not be hidden by a tall screen of peasticks in a vegetable plot close to the house. But there is usually an alternative to siting the vegetables at the far end of the garden behind a trellis or rustic screen that cuts the garden in two. Flower beds can be used to give partial screening, but there is no reason why a vegetable plot should not be attractive in its own right.

### NATURAL CONDITIONS

When choosing sites for vegetables and flowers, take account of the shade that will be caused by near-by trees, buildings and walls, and get to know the condition and types of soil the garden offers so that they can be used to the best advantage.

### USING CONTOURS

One of the first decisions to be made is whether the natural slope of the site is to be levelled or left alone—and perhaps even exaggerated. Sloping sites can be more interesting than flat ones, but are more difficult to plan and maintain. If

the site slopes up away from the house, make any retaining walls or earth banks well back from the house, to avoid "shutting it in".

### EASE OF MAINTENANCE

When shaping the lawn avoid sharp angles and tiny peninsulas that will be difficult to mow; design abutting borders so that the mower can change direction in gentle curves rather than sharp bends. Allow for paths between hedges and the backs of borders so that hedge trimming and other maintenance is not too tedious.

### COST

It is unwise to make do with cheap materials in constructing permanent features; it is better to have temporary ash paths until the budget will stand the cost of crazy paving than to build all the paths of plain concrete which can look hard and cold in some situations.

### PROGRESSIVE DEVELOPMENT

It may take some years to get the whole of a new garden into good heart. If time and available labour are limited, allow part of a large site—particularly in a vegetable garden—to lie fallow until it can be brought into production without undue strain.

If a plan is decided upon before work commences, and then adhered to, progressive development of the site is possible, so that, for instance, hedges can be grown or fences built round an exposed site before the cultivation of plants that are known to require a sheltered situation is attempted.

On the following pages are ideas and constructional details for the features that may be introduced when a plot of land is turned into a garden. Most can be carried out by the average handyman, and all are capable of adaptation to suit varying needs and circumstances.

### LEVELLING

In deciding how much levelling a garden site needs, try to keep as many natural contours as possible, to save soil movement and to avoid an artificial look.

For a lawn, gently rolling contours or slopes can be attractive; but it is essential to keep some areas flat: the terrace or a place for sitting-out is one example; the site for a pool or a shed is another.

The equipment required for levelling is very simple: a collection of strong wooden pegs about 2 ft. long and at least 1 in. square, a length of level boarding 8 to 10 ft. long and stout enough not to sag in the middle, a spirit level and a mallet or hammer.

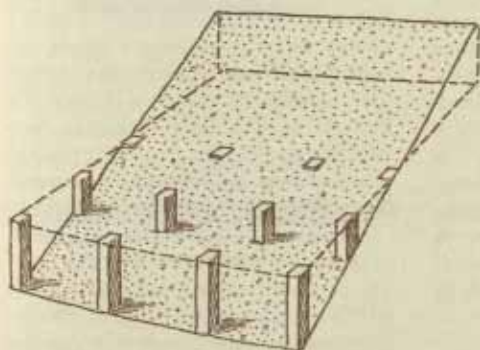
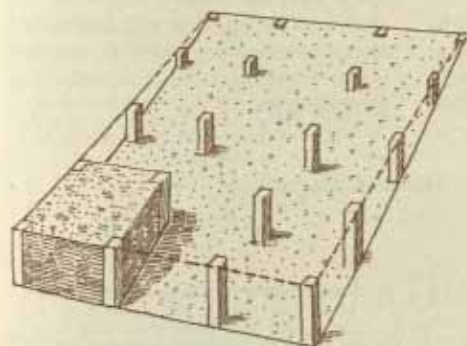
First decide on a spot in the garden at a mean level to which the remainder of the site can be levelled with the minimum of labour and expense. Once this has been selected drive a peg into the spot flush with the ground. The top of this peg will mark the height for the rest of the garden.

During any levelling operation it is important to see that no poorer subsoil is brought to the surface and allowed to remain there. Tackle one small area at a time: carefully remove as much of the top soil as possible, keeping it to one side until all the subsoil has been moved and then place the top-soil on top to bring the surface level.

On a very uneven site, boning rods will be required. These are strong stakes, 3 ft. or so in length, with a cross piece attached to the top to form the shape of a large letter T.

Select the mean level and drive a boning rod into the ground so that it is as near eye level as possible. A few feet away in the direction of the highest part of the garden, drive in a second boning rod. To check for level, place a straight piece of board on top of the rods, and adjust by using a spirit level.





### LEVELLING A SLOPING SITE

Level a portion of the site at a time, beginning with a low area that will use up earth from a part of the garden that is higher than the mean level. Drive in a peg so that the top is flush with the ground at the mean level of this plot. Using the level board as a spacer between pegs so that the board can just "sit" on two pegs at a time, drive in further pegs all over the site, checking the height of each one by placing the spirit level on the board, which in turn rests on two pegs at a time.

Once the site has been pegged out in this way, take away or add soil until the whole site is just level with the tops of all the pegs. The amount of soil to be moved will depend, of course, on the state of the ground. In many cases a rake will be a suitable tool for most of the work, apart from adding a little soil here and there from the higher parts with the help of a spade and wheelbarrow. As the soil is levelled make sure that it is firmed well to prevent sinking later on. This applies particularly to light, sandy soils; heavy clays should not be compacted too much.

Drive in a third post at the highest part of the site, in a direct line with the previous two. If a visual sighting is now taken from the first post, along the top of the second post, the third post can now be adjusted until it, also, is exactly level with the previous two.

It may well be necessary to check for level across the site, and more boning

rods can be used in the same way, taking frequent level checks by eye from any two of the original boning rods.

Measure the distance from the cross-piece to ground level on the rod at the mean level and mark off the same distance on all the other rods. Then a general picture of the amount of levelling required will be seen.



### MARKING OUT BEDS AND BORDERS

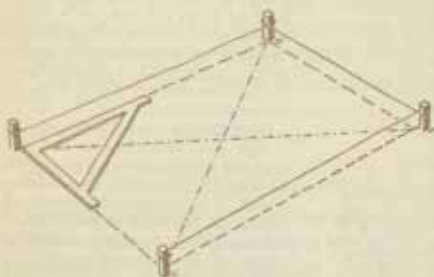
This is a creative part of garden construction as it is the stage where the garden begins to take shape. Working from a scale plan of the whole site, mark out simple straight borders using a tape-measure and a garden line stretched taut between pegs, driven in at intervals to mark out the exact area.

As it is important to mark out right angles carefully, it is worth while making a permanent marker board or triangle from lengths of wood. If the sides are

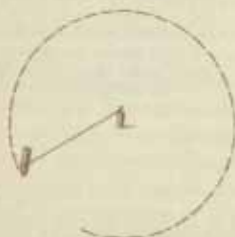
3 ft., 4 ft., and 5 ft. long, there will be a right angle between the two shorter sides. (All measurements should be taken on the *outer* edge of the timbers.)

There is much to be said for informal outlines in the garden. They are more natural, and in the smaller garden irregular outlines help to create more interest and can give an illusion of greater space. Irregular sweeps and curves are easily marked out with a pointed stick. A trickle of lime along any of the marking outlines will preserve them effectively for some time.

### MARKING OUT REGULAR-SHAPED BEDS

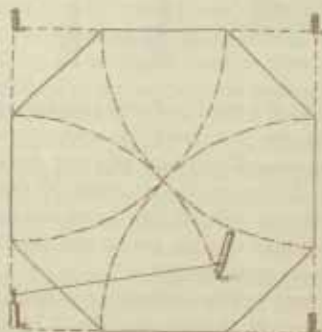


A home-made set-square can be used to make the right-angled corners in a rectangular bed. Mark them with pegs and lines. To check the accuracy of the finished shape, measure the diagonals: they should be the same length.

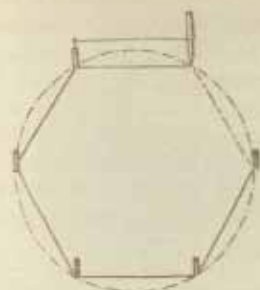


To mark out a circular bed drive a peg into the ground at the approximate centre of the bed. Fasten a length of twine half the diameter of the required bed to the peg, and attach a sharp stick to the other end of the twine. Holding the stick so that the twine is kept taut, scribe a circle into the soil, using the centre peg as a pivot.

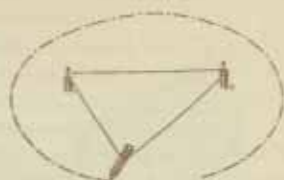
To make an octagonal bed, mark out a square, and draw four arcs from the corners, using as a radius the distance from a corner to the centre of the square. The points where the arcs cut the square make the corners of the octagon.



## GARDEN CONSTRUCTION



To make a regular, six-sided shape draw a circle and, using the same radius, mark off points around the circumference. Join up the points



An oval bed can be marked out by using two pegs and a length of cord approximately three times as long as the distance between the pegs. Knot the cord into a loop, place it over the pegs and, with a sharp stick taking up the slack, scribe the shape. The closer together the two pegs are, the more nearly circular the oval will work out

## PATHS

Well-constructed and attractively sited paths can add a great deal of character to a garden. Their main purpose is to link the garden's principal features and to provide easy access to areas that require attention. It is advisable to choose materials that will blend with the type of garden under construction, but take advantage of the scope that modern materials provide to produce intriguing designs and patterns.

Straight paths are the cheapest to construct as they need less material, but curving paths are more interesting. The number of paths depends on the size of the garden and the number of features in it, but it is a sound rule to keep it to a minimum.

Main paths should be wide enough to allow two people to walk along them comfortably side by side, and to take a wheelbarrow easily; a useful width is 3 to 4 ft. Even subsidiary paths should not be less than 2 ft. wide, and a driveway will need to be at least 12 ft. wide.

## FOUNDATIONS

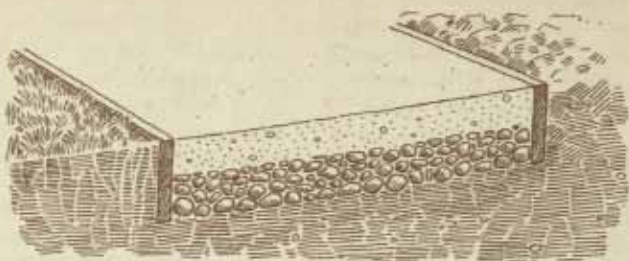
Lay paths on firm foundations, as solid support and good drainage will prevent cracking and general subsidence later on. The lighter the soil, the more consolidation of the foundations will be required.

Mark the site for a path by line and pegs and excavate the soil to a depth of at least 6 to 9 in. Fill the trench with rubble, clinker or broken bricks, ramming down firmly. The finished level of this material should allow for the thickness of the surfacing material.

## CONCRETE PATHS

Concrete is reasonably priced and fairly easy to use, and so has become one of the most popular materials for paths.

It is stronger if it matures and dries slowly. Cover the surface with sacking, which should be kept damp during dry weather, or use sheets of polythene which create a natural dampness underneath. Never lay concrete during frosty weather as it may crack.



### CONSTRUCTING A CONCRETE PATH

Lay lengths of timber down both sides of the path, and level their top surfaces to the correct height of the finished path, allowing for a layer of concrete at least  $\frac{1}{2}$  in. thick. As the concrete is laid, draw a strong piece of board across these levelling guides to even out the surface. Use a heavy piece of wood to ram the concrete well into position, as much of the path's final strength will depend on its firmness. Whether the concrete should have a smooth or rough finish is a matter of choice, but a smooth finish is much easier to keep clean.

### MATERIALS

A suitable mix for concrete paths is:

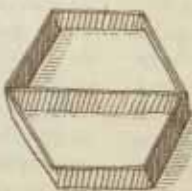
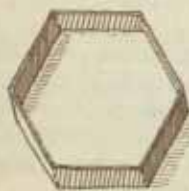
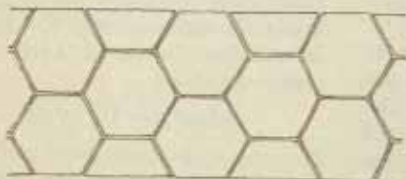
- 1 part cement
- 2 parts sand
- 3 parts shingle

Mixed ballast is often used to avoid the need for buying sand separately; the mix is:

- 1 part cement
- 4 parts mixed ballast

The best size for the ballast is a grading from  $\frac{3}{8}$  to  $\frac{1}{2}$  in. Use good quality graded from  $\frac{3}{8}$  in. down (to give a smooth finish), with a good proportion of larger particles to help bind the mixture.

One cubic yard of concrete will cover approximately 16 sq. yds. of path to a depth of 2 in., or about 10 sq. yds. of path to a depth of 3 in.



### MOULDED BLOCKS

Cement blocks of any shape or size can be made in moulds—either iron or well-smoothed wood. For this six-sided shape, suitable measurements are: diameter, 18 in.; depth, 3 in. Half pieces can be made for edging the path by putting a strip of metal or wood across the mould. Grease the mould liberally to make removal of the cement easy.



## READY-MIXED CONCRETE

Concrete purchased in this form offers a tremendous saving in time and labour. It is delivered in special lorries that mix it on the way and deliver it as near to the actual work as possible. The usual minimum quantity is 1 cu. yd. The concrete can be ordered in several mixes and there are supply depots in most areas.

## CRAZY PAVING

Crazy paving gives a natural effect which is suitable for almost any garden design.

Various grades can be purchased; the usual thickness is about 1 to 1½ in., and thicker grades are from 1½ to 2½ in. The approximate quantities that will be required can be calculated from the following table and are based on a 10-ft. length of pathway:

Thickness of stone	Path width		
	2 ft.	2½ ft.	3 ft.
1 to 1½ in.	3 cwt.	3½ cwt.	4½ cwt.
1½ to 2½ in.	5½ cwt.	6½ cwt.	8 cwt.

Try to buy crazy paving locally as carriage costs are high.

## LAYING

Crazy paving can be laid either in loose material, such as ashes or sand, or in cement, which gives a stronger, more permanent path. As the individual pieces are not always of uniform thickness, take care when bedding them down to make each piece perfectly level and stable. Use a spirit level on a short piece of straight-edged wood to ensure that a constant level is maintained in both the width and the length of the path as the work proceeds.

Lay the largest pieces of paving first and fill in the gaps with smaller pieces, so that the final spaces between the stones are not more than about 1 in. wide.

Lay larger pieces along the edges of the path; small pieces are not as stable and if

laid on loose material may tip up when trodden on.

The concrete in which crazy paving is set should be about 2 to 2½ in. thick, on a firm foundation. The best mix is one part cement and four parts sand. Tap each piece of stone firmly into the wet cement, and a day or two later, when the concrete has set, fill in the joints with the same mixture. Be sure to keep the cement off the surface of the stones.

A pleasant effect can be gained if suitable creeping plants are established in the path. For this purpose leave gaps between stones, making sure that ample room is allowed for root development. Fill in the holes with good soil, right through to the soil below the foundation.

## SLABS

Prefabricated slabs for path-making are available in several standard sizes, ranging from about 9 in. square to about 2 ft. square. Rectangular slabs can also be obtained. A pleasant and unusual design can be created if a mixture of several colours is used. This type of paving is laid exactly as crazy paving.

## BRICKS

Quite intricate patterns can be formed from bricks; they can be laid on edge or flat or in combinations of the two. Use only old or well-weathered bricks with coarse surfaces (new bricks look out of place in the garden and are expensive), and lay them in a thin layer of concrete, in the same way as crazy paving.

Quite a large number of bricks are required to cover a comparatively small area. The following table gives numbers required for a 10-ft. long path:

How laid	Width of path		
	2 ft.	2½ ft.	3 ft.
Flat	71	89	107
On edge	107	134	160

## GRAVEL

Although gravel is often used for path construction it tends to stick to shoes in wet weather; also, it does not keep its level well and frequent raking is necessary. But it is cheap and easy to obtain.

Apply a thickness of 2 to 3 in. on top of a secure foundation. It is a good idea to mix very coarse sand with the gravel at the rate of 1 part to 2 parts gravel, to bind the gravel together. Gravel paths do not suppress weeds, but it is comparatively easy to keep them clean by running the hoe through the gravel or by using a selective weedkiller. The following table shows the quantities of gravel required for 10-ft. lengths of path:

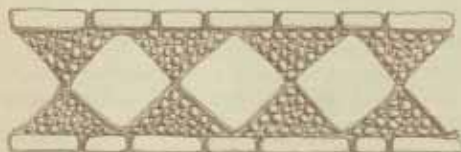
Thickness	Width of path		
	2 ft.	2½ ft.	3 ft.
2 in.	3¼ cwt.	4 cwt.	5 cwt.
3 in.	5 cwt.	6½ cwt.	7½ cwt.

## CONTRASTING MATERIALS

Different materials can be blended together to make interesting patterns for paths and terraces. But remember that such surfaces may be difficult to walk on, particularly in shoes with high heels



Brick and concrete squares



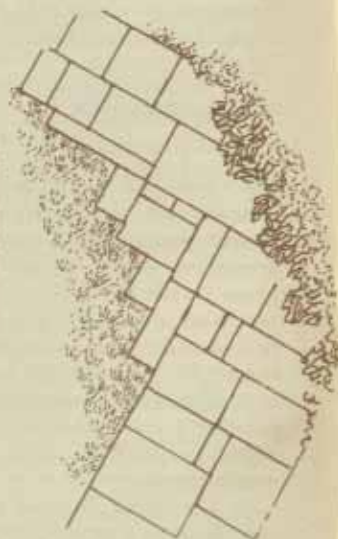
Stone slabs with cobbles

NEW MATERIALS  
FOR QUICK RESULTS

One easy way of laying paths is to use a special tarmacadam material that is sold in sealed paper bags complete with granite chippings which are scattered on the surface to form an attractive and crisp-looking pattern.

The material is tipped out of the bags and simply raked level to an average thickness of ½ in. The chippings are then scattered evenly over the surface and rolled in, and the path is ready for use. It is, of course, essential to have a firm foundation so that the path will not become "lumpy" after hard use.

Another very quick method is to pour a liquid bitumen solution (which is obtainable in tins) over the path area and scatter stone chippings or sand over it. The surface then merely requires rolling.



## TURNING A CORNER

A pattern of different-sized paving stones can be fitted together to turn a corner neatly and give an attractive, irregular edge to a path



A crazy paving path looks well in any type of garden. Bordering plants overhanging the edges of the path give a softer effect



Flat pebbles make a surface that is more decorative than functional. They look particularly attractive near water, but are unsuitable for much-used paths, or paths where a barrow will often be wheeled

#### PATHS OF UNDRESSED NATURAL STONE SET IN CEMENT

Crazy paving is excellent for most types of path. Use hard stones that will not flake, and make the spaces between them less than 1 in. wide







A path of paving stone and cobbles set in concrete

#### PAVING BLOCKS

Concrete paving blocks and dressed stone are sometimes available from local councils when street paving is being replaced; they are ideal for surfacing paths and terraces

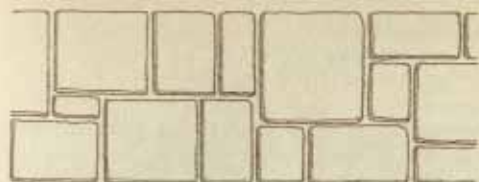


Stone slabs set in grit



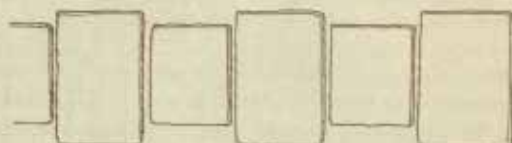
Simple path of concrete slabs

## GARDEN CONSTRUCTION



### PAVING BLOCKS

Simple paths of concrete slabs



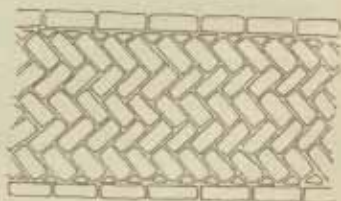
Large paving stones set in grass and among low-growing shrubs give a greater impression of space and informality than a precisely-edged path. Set slabs level with lawn surface so that the mower can go over them

This brick path has a brick edging and a slight camber to aid drainage. Hard, well-fired bricks are best, as the softer types tend to crack in frosty weather



#### BRICK PATHS

Patterns of bricks; it will be easier and quicker to lay a path if the pattern does not require cut bricks





## STEPS

There are two particularly important points to keep in mind when building steps: proportions in design, and safety. The basic rule for proportions is that twice the riser (the height of each step) added to the tread (the part which is trodden on) should equal 24 in. The best proportion is 12 in. tread and 6 in. riser.

Weak or badly constructed steps are dangerous, and great care should be taken to see that plenty of rubble is rammed into position as a foundation. On light, sandy soils at least 6 in. of rubble foundation will be required; less on heavier soils.

Do not build steps that are too narrow. Their width should be in proportion to the feature into which they are designed, but they must be wide enough to permit comfortable and safe passage. From the point of view of design, a sound rule is: the longer the flight of steps, the wider it should be. It is unwise to use small material in the construction of steps, unless it is bedded down into concrete; for instance, small pebbles, small pieces of stone slabs or bricks should not be set in ashes or sand.

The simplest and easiest form of step is made from concrete. In many cases the actual steps and risers will need to be cut out of a solid bank of earth. Begin at the base, and cut away sufficient earth to allow rubble to be firmly packed into place and to leave room for the concrete surface material.

For the construction of the risers, cut pieces of wooden shuttering to the depth of the riser.

Lay a concrete surface on a firm foundation at the foot of the steps. Place the first piece of shuttering in position on this surface and 2 in.—the thickness the

concrete will be—away from the face of the soil part of the riser. Drive in strong wooden pegs to hold the shuttering in position and fill in the 2-in. gap with concrete. Use a piece of wood to tamp or work in the concrete as it is applied until it finishes flush with the top of the soil and rubble riser. Two or three inches of wooden shuttering will now be left above this concrete riser. This will be the depth of concrete to apply to form the tread. Construct the tread by applying concrete and smoothing it off level with the top of the wooden shuttering of the riser. It will be necessary, of course, to provide shuttering for the sides of the steps as they are built up, unless they are cut out of a bank of soil, in which case the soil itself will support the concrete as it sets.

Curved steps can be constructed with concrete, but they require more complicated shuttering. The method is exactly the same, except that the curves are provided by bending flexible material, such as sheet metal or waterproof hardboard, and holding it in position with pegs.

Stone slabs—coloured, plain, or a mixture of both—are ideal for treads. Although large pieces can be bedded down into ashes or sand on a firm rubble foundation it is better to lay them in a thin base of concrete. About 1 in. of concrete will be sufficient and the joints can either be pointed or filled with concrete. A suitable mix is: 1 part cement, 4 parts sand.

The risers can be made from smaller pieces of slab, also cemented in place, but it is usually better to use weathered or rough-faced bricks, as they are much easier to lay.

Steps can be made completely with

bricks, using for preference either old ones or rough-faced types. They can be laid flat or on edge and, if bedded into a thin base of concrete, will produce extremely strong, durable steps.

Where slabs or bricks are used, tap them gently into the wet concrete as they are laid so that they "sit" well into the foundation. Make frequent checks with a spirit level on a short piece of timber laid across the bricks.

If a mixture of materials is to be used in step construction, some attractive and unusual effects can be achieved—pebbles set in concrete with brick or paving surrounds, or bricks set at various angles. As paving slabs can now be obtained in various sizes and shades, there are end-

less variations in design to choose from.

An unusual flight of steps can be made with logs of wood as the risers. The treads are the earth itself, and the log risers are held in position by strong wooden pegs driven in at each end. It is as well to sink each log slightly in a shallow trench to give added strength and stability.

Logs of at least 6 to 9 in. diameter should be used, and it is best to use wood that has been felled and cut for some time.

As with walls, plants can be added to steps to give a more natural finish. Leave intervals in the treads and risers in which to naturalize suitable plants. These holes must lead to soil beneath, and in many cases it will be necessary to allow for this at the rubble-laying stage of construction.



STYLES IN STEPS

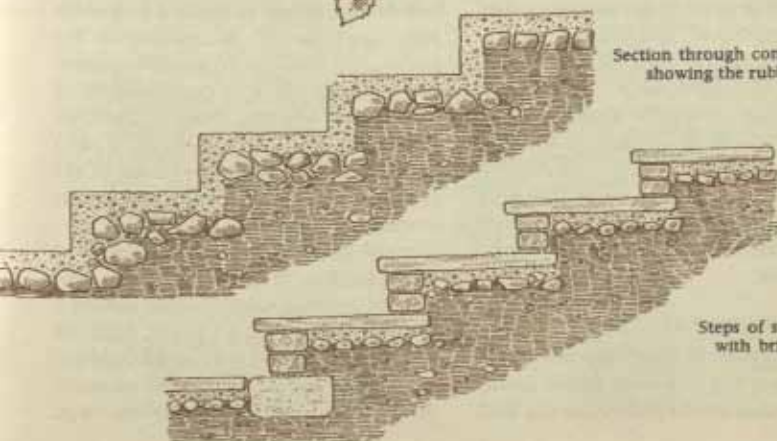
Steps may be needed to provide access to the back of a bank planted with shrubs. Circular cement slabs set irregularly can look delightful. They can be made in a metal mould; the metal tyre from an old cartwheel would be ideal for the purpose.



Between banks of clipped rosemary and lavender hedges, wide steps of stone and cobble give a mature and mellow look.



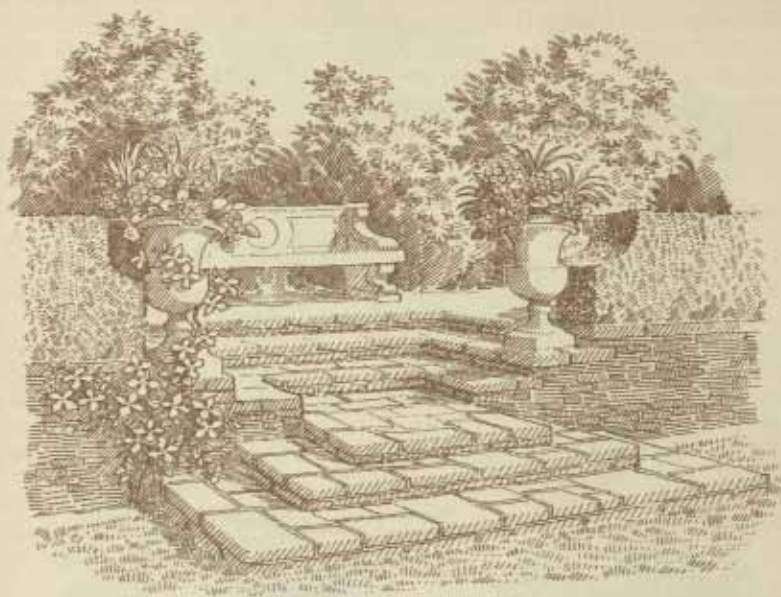
Varying levels in a lawn  
can be linked with stone  
steps set into the grass



Section through concrete steps,  
showing the rubble base

Steps of stone slabs,  
with brick risers





A formal—and complicated—pattern of steps leading to a raised terrace.  
The width of the treads is varied to avoid monotony

## WALLS

Walls may be needed in the garden for protection or privacy, for dividing areas, or for retaining the soil where there are drops in level or steps. Whatever the function of garden walls, they can be turned into attractive features. But, however simple the construction, walling is not cheap.

Old or rustic bricks blend well in most gardens, and effective designs can be constructed of York, Somerset or Cotswold stone.

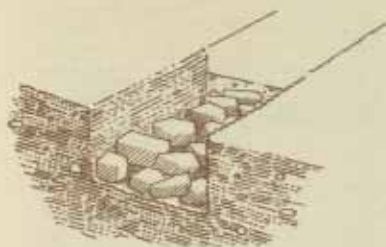
### CONSTRUCTION

The strength of any wall depends on its foundation. Dig a shallow trench about 9 in. deep and a little wider than the wall

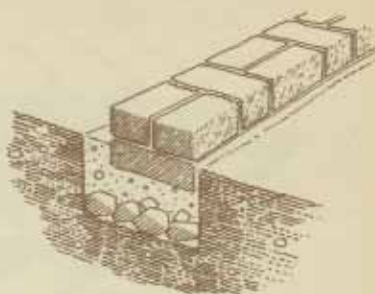
is to be. Tip rubble into the trench and ram it well down, to make a 6 in.-deep layer. Lay 2 to 3 in. of concrete on top and smooth roughly. (A suitable mixture for the concrete is: 1 part cement,  $3\frac{1}{2}$  parts sand, 5 parts shingle. If mixed ballast is used: 1 part cement, 6 parts mixed ballast.) The finished level of the foundation should allow the first course of walling to be just below soil level.

A wall constructed with slabs of stone can be built up in two ways: dry, or with cement bonding which will be needed if the wall is more than 3 to 4 ft. high. To bond a wall spread a layer of concrete about  $\frac{3}{4}$  in. thick over each course of stone and place the next course in it,

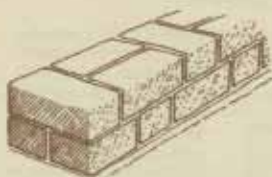
BUILDING A BRICK WALL



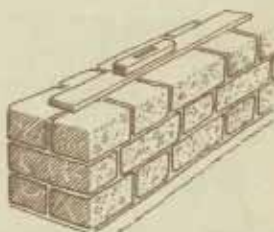
Dig a trench a little wider than the wall and lay a foundation of rubble and concrete



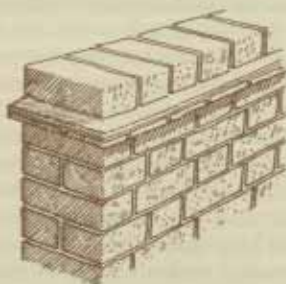
Lay the first course of bricks just below soil level



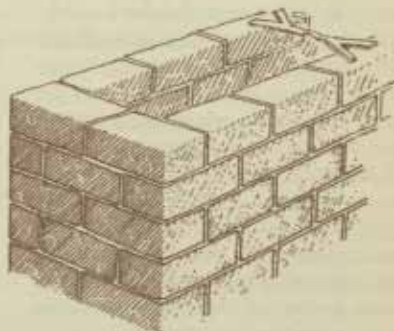
In each course, lay headers and stretchers (widths and lengths) alternately to give greater strength, or build alternate courses of headers and stretchers



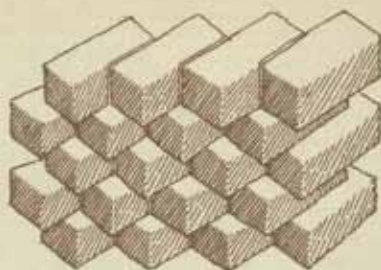
Make frequent checks on the wall's vertical and horizontal faces with plumb-line and spirit level



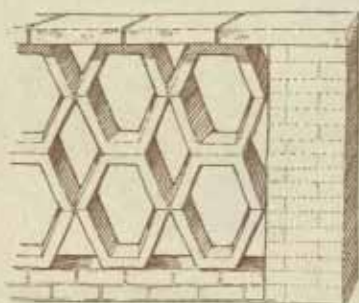
Finishing a wall: a double layer of tiles overlapping the wall by an inch all round is finished off with a last course of bricks



Metal ties should be used in a cavity wall more than 3 ft. high to hold the two sides together. They should be spaced at 3 ft. intervals



A more ambitious method of laying bricks: this diagonal effect is ideal for a bank-retaining wall



A decorative wall of precast, V-shaped concrete blocks, with concrete slabs laid across the top. This type of wall looks best when painted

tapping each slab in place as the work proceeds. A joint should never be directly above a joint in the row beneath. As work proceeds, point or smooth the joints over with a trowel. Select stones for the bottom two courses from the largest pieces in the pile, to ensure that a really firm, strong base is provided.

A dry wall, constructed without cement, is ideal for low features. The same principles of stone selection and laying should be observed. Bed each course in a 2-in. layer of good loamy soil which should be packed thoroughly between the joints with a rounded stick.

A double thickness of brick makes a good solid wall. Make sure that each row of bricks is securely laid in a  $\frac{1}{2}$ - to  $\frac{3}{4}$ -in. layer of mortar or cement. Bond the

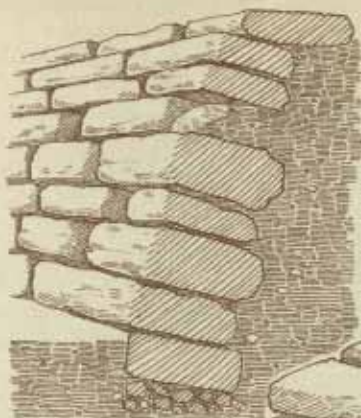
bricks as for walling stone, and check the level frequently with a spirit level.

A great deal of time can be saved in ensuring that each row of bricks is level if a brick is laid at each end of the row first of all and, when completely straight and level, a length of strong twine is run between these two bricks, across their tops, to serve as a level along the length of the wall. This twine can be attached to two long nails inserted in a course of bricks lower down. Use a plumb line to keep the faces of the wall vertical.

Where high walls are required, it is *not* advisable to construct dry walls, as sufficient strength and rigidity can only be supplied by a concrete or mortar bonding. Walls more than 5 ft. high require buttresses every 15 ft. along the wall.



## STONE WALLS



If the wall is retaining an earth bank, slope it in slightly towards the bank

Double or cavity walls can be attractive. Two walls are constructed close together and closed at the ends. The centre or cavity is filled with good quality loam, on top of about 9 in. of small rubble which will ensure good drainage. Usually this type of wall is about 2 to 3 ft. high and about 2 to 3 ft. wide



## TERRACES AND PATIOS

In gardens that have a pronounced slope or are very uneven, terraces are often made to provide level sections for lawns or flower beds. They can be used, too, as patios—sitting-out areas—and in this case are usually paved in some way.

Between terraces at varying levels, or between a patio and the rest of the garden, steps and low walls may be needed; the siting and style of these features will have a great effect on the look of the finished garden.

The work of levelling is the biggest and most important task in terrace building (see Levelling). It is important that dry and firm flooring is provided for a patio

that is to be used as an outdoor living-room during summer months. There are several alternative materials, ranging from bitumastic preparations to bricks and paving stones; choose one that suits the character of the house, for the patio will probably be constructed close to it. If the house is of modern design, coloured slabs arranged in simple designs look effective; an older property is better suited by rustic bricks and insets of pebble stones. Crazy paving is a most attractive material to use, but ensure that gaps between the stones are filled with cement, so that there is no danger of people tripping over raised edges.

## GARDEN CONSTRUCTION

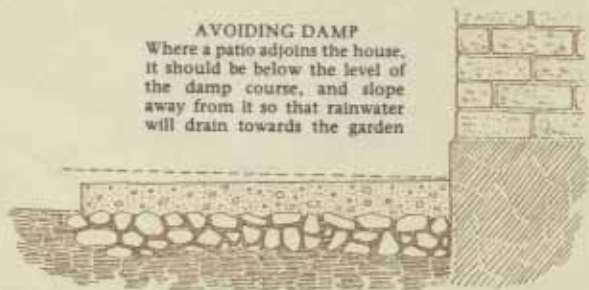
Keep all paving work below the level of the damp course of the house. The finished surface of patio or terrace must be at least two or three brick courses or 6 to 12 in. below the damp course, which is usually recognizable as a thin layer of

bitumen felt or similar material running between two courses of bricks.

An unroofed patio should have a slight slope away from the house so that rainwater will not collect but be carried away from the house walls.

### AVOIDING DAMP

Where a patio adjoins the house, it should be below the level of the damp course, and slope away from it so that rainwater will drain towards the garden



A patio can be created by merely widening part of a path. Place the garden seat near richly-scented plants



This terrace has been constructed as a suntrap. To the north and east tall shrubs provide shelter from the winds. The heavy appearance of the wall is relieved by varying its height and adding two finials



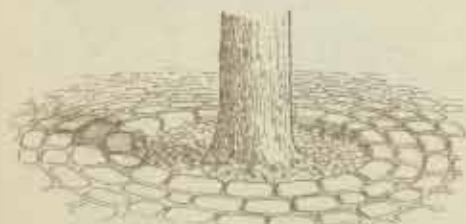
#### MOBILE PLANTS

Earthenware pots of varying shapes and sizes can bring the charm of foliage and flowers to a paved terrace, and they can be moved about to make different effects

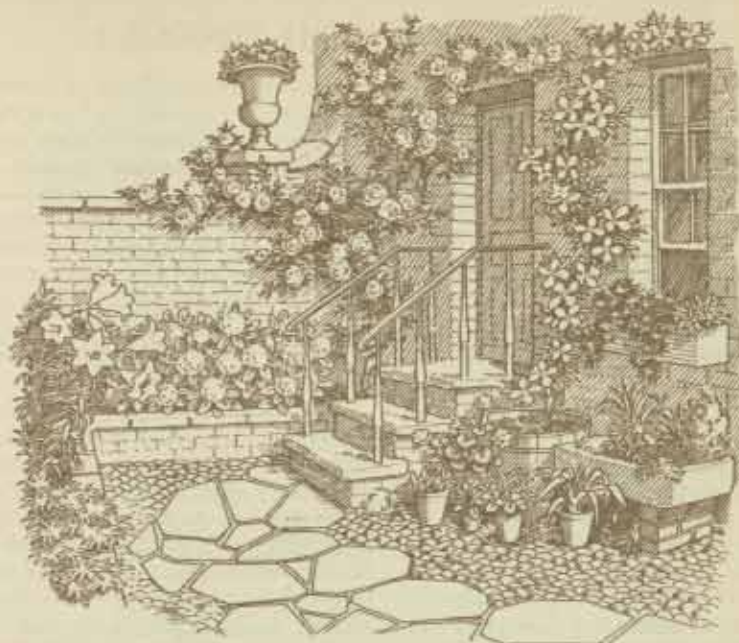




Raised beds round the trees in a terrace allow moisture to reach the tree roots, and also provide an ideal site for growing bulbs



Building a terrace may involve making provision for trees on the site. Leave an unpaved area round each one so that moisture can get to the roots; it can be covered over with loose pebbles or planted with shade-loving plants and ferns



Crazy paving and cobbles, with raised flower beds and plants grown in a variety of pots and containers, have here turned a concrete yard into an attractive garden. The varied surface of the terrace gives contrasts of colour and texture



A large paved patio should be sheltered from the wind: trees, walls and hedges are all useful for this purpose. Tough, low-growing plants help to soften the edges of the paving, and small plants such as alpines can be set between the stones

## FENCES, SCREENS AND PERGOLAS

Fences and pergolas in a huge variety of designs and sizes can be easily erected. Like walls, they are used to provide privacy, shelter from winds and sometimes to divide the garden neatly into sections.

### FENCES AND SCREENS

Fences must be strong, not only to support their own weight, but also to withstand considerable wind pressures, especially if the garden is exposed and the fences are close-boarded or solid. Creosoting or other treatment will be necessary to prevent wooden fences rotting.

The strength of a fence will depend upon its supports and the manner in which they are inserted in the ground. Timber supports of a thickness of 3 to 4 in. will be sufficient for most purposes; treat them with wood preservative before sinking them in the ground. Where exceptional strength and support is required, use concrete posts, which can be purchased in various sizes. For light fences the posts can be spaced about 10 ft. apart; but the usual interval is 6 ft.

The "clean face" of the fence—or the side which does not have the supports showing—should face the neighbour's garden. Make quite sure, also, that the posts and fence are inside your boundary line. By law, fences between gardens must not exceed a height of 7 ft.

### TYPES OF FENCES

A solid or close-boarded fence gives complete shelter and privacy, but may be ugly and uninteresting. Usually lengths of boarding about 6 in. wide and  $\frac{3}{4}$  to 1 in. thick are used. The pieces are placed close up to each other and nailed on to at least two horizontal rails let into the supporting posts. The bottom rail should

be about 2 ft. above ground level and the top rail about 2 ft. from the top of the fence. Both rails should be fairly substantial, about 3 in. deep and 2 in. thick.

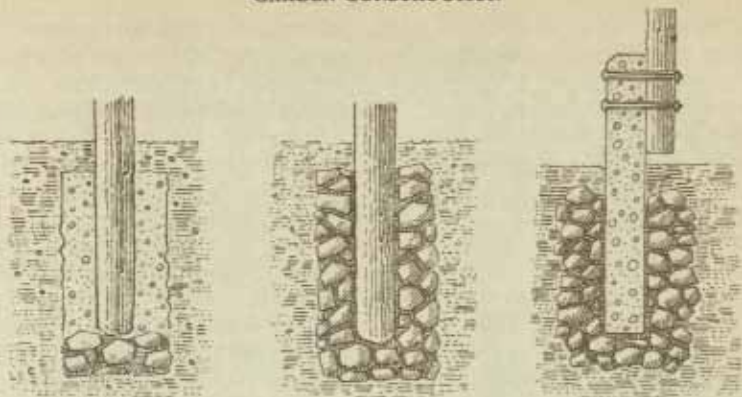
Another type of solid fence is made from weatherboards. These are wedge-shaped pieces of wood usually  $\frac{4}{5}$  to 6 in. wide with one edge  $\frac{3}{4}$  in thick and the other edge tapering to  $\frac{1}{4}$  in. As these are laid, the thick edge of one piece overlaps by at least  $\frac{1}{4}$  in. the thin edge of one that has just been fixed.

A more expensive type of solid fence can be made up of tongued and grooved timber. Each piece has a groove cut in one edge and a tongue, or thin strip, sticking out of the other. As the fence is built up, the tongue part of one length of wood is carefully tapped into the groove of the length which has just been fixed. A very effective design or pattern can thus be produced, especially if "V-matching" is used. Small angled cuts are made on the edges of the wood, so that when the pieces have been joined together, a grooved surface is produced.

Even fences of more open design will provide a great deal of privacy and shelter if they are clothed with suitable plants.

An open lattice design can be constructed quite easily and cheaply. Make a strong, square framework of 1-in. by 1½-in. wood; this framework should be made into convenient lengths about 6 to 8 ft. long if a long fence is under construction. For the lattice, use thin laths of wood about 1 in. by  $\frac{1}{4}$  in. Nail vertical lengths 8 in. apart to the framework, and then nail horizontal lengths over the vertical strips, again spacing them 8 in. apart. Where several sections have to be made up for a long fence, fasten them to supporting posts of 2-in. square timber let into the ground at 6 to 8 ft. intervals.





## SINKING FENCE SUPPORTS

Whether timber or concrete, fence supports should be sunk into the ground to a depth of at least  $1\frac{1}{2}$  ft. The bottoms of timber posts will need to be carefully treated with a suitable wood preservative; allow the ends to stand and soak in a deep container of the preservative for at least 24 hours. Pack the supports firmly into their holes with pieces of brick or slabs of stone, and then replace the soil, firming it well round the posts with a heavy piece of wood. Better still, position the posts on a rubble base and pour concrete into the holes round the posts, working it down thoroughly with a piece of stick. If the soil is often wet, sink a  $3\frac{1}{2}$ -ft. concrete post in the ground and bolt the wooden fence post to it, keeping it clear of the ground. The wood will then not be as liable to rot.

Timber of greater thickness can be used to make more effective designs and pieces 3 in. wide and 1 to  $1\frac{1}{2}$  in. thick are often used. Instead of overlapping the vertical or horizontal pieces, such heavy timber must be crossed with halving joints. They can then be nailed, or preferably glued and screwed together. The size of the lattice squares should be in proportion to the thickness of timber used. An average size is 2 ft. square.

Many interesting fence designs can be produced if different materials or styles of construction are mixed. There are many possible combinations, but here are a few simple ideas:

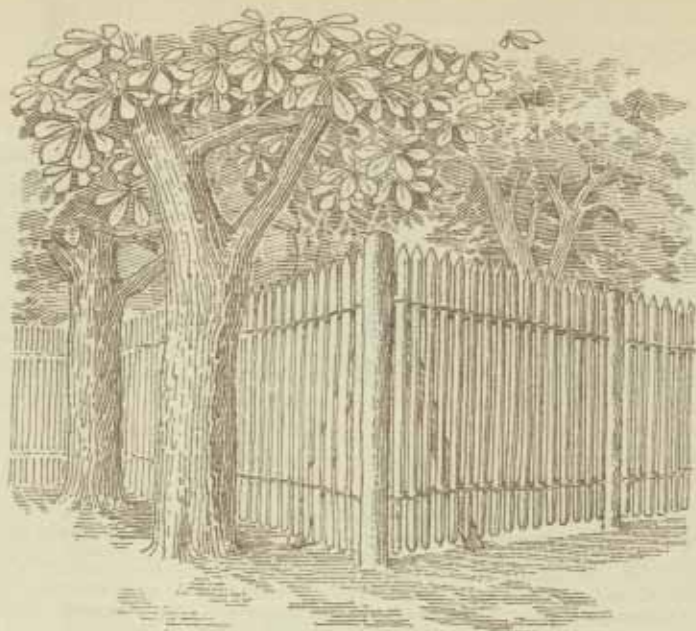
An 8-ft. long section of either tongued and grooved boarding, or 4-in. wide and  $\frac{1}{2}$ -in. thick butt-jointed timber, followed by a 4- to 6-ft. long section of 3-in. by  $1\frac{1}{2}$ -in.

thick timber set with the  $1\frac{1}{2}$  in. edge facing the garden. Space these pieces of timber vertically and about 9 to 12 in. apart. The complete 12- to 14-ft. sections should be framed like a picture with wood 4 in. wide and  $1\frac{1}{2}$  in. thick. The height of the completed fence can be anything from 5 to 7 ft.

Another design can be produced in exactly the same way if bamboo poles of at least  $1\frac{1}{2}$  in. diameter are used in place of the 4-in. by  $1\frac{1}{2}$ -in. thick timber. The poles can be secured in place with long brass or galvanized screws fixed through the framing wood and into plugged holes in the top and bottom of each pole.

Interwoven panels make excellent fences and screens. They are most attractive and easy to handle. These can be





Cleft chestnut paling is a useful type of fence. It can be purchased in rolls of various lengths and up to heights of 4 to 5 ft., and can be wired to up-rights sunk into the ground at 6-ft. intervals. The individual palings, usually spaced a few inches apart, are attached to horizontal strands of strong wire. It is possible to purchase fencing with the paling nearly touching, to give more privacy and greater wind protection.

made at home, using strips of 3-in. wide and  $\frac{3}{4}$ -in. thick wood, although ready-made sections are usually obtainable in heights from about 3 ft. to 6 ft. Suitable supporting posts for the sections can also be bought, and capping pieces for the tops of these posts provide a neat finish.

Although most types of interwoven fencing are not completely private, it is possible to purchase certain types that are completely peep-proof. They are, of course, more expensive.

Another type of ready-made fence is wattle, which is similar in construction to basket work and has a charming rustic appearance. Sections 6 ft. long and of

various heights are readily obtainable.

Many gardens, especially those in new open-planned estates, have low brick front walls. Sections of low fencing erected on top of these walls give greater privacy and protection.

It is also possible to buy fencing kits in a very wide range of designs. All the parts are cut to length, all necessary joints, holes and slots are accurately cut, and even the nails and screws are provided.

#### PATIO SCREENS

If a patio cannot be sited where there is privacy and natural shelter from winds, it may be necessary to provide walls at

both sides and perhaps partly across the front of the feature. Often a selection of trees or shrubs or even a well-trimmed hedge serves the purpose; but artificial protection is more speedily assembled and a greater variety of design can be achieved.

The most versatile material to use is timber. Soft-woods, such as deal and western red cedar wood, are the easiest to work, and the latter is particularly good as it produces a natural oil that combats rot and insect damage. The wood is an attractive reddish-brown colour that weathers to silver-grey unless varnish is used to preserve its original colouring. Cedar wood is more expensive than other soft-woods, but the initial outlay is well worth it. Teak and oak are two very durable timbers, but their hardness makes them difficult to work.

A most attractive patio-framing can be constructed in the form of large open lattice design with the squares or openings about 2 ft. by 2 ft. Cut the timber from 3-in. by 2-in. planed cedar or other soft-wood. Use halving joints and screw or glue them. The bottom 3 ft. or so can be filled in with tongued and grooved wood,

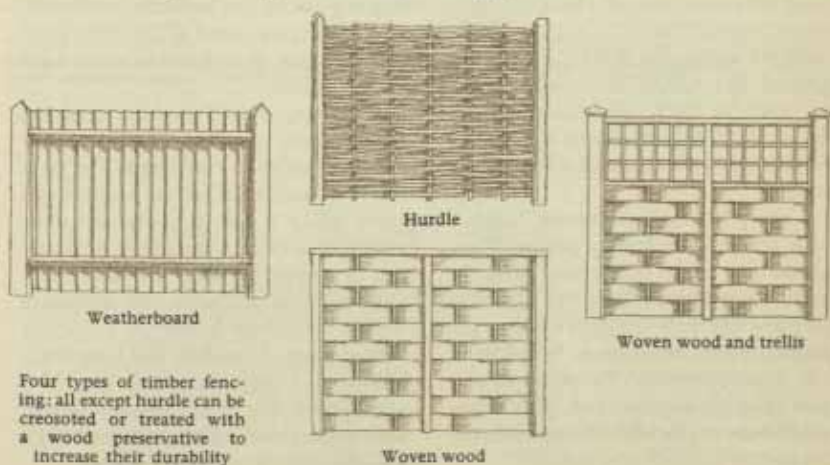
4 to 6 in. wide and about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. thick. The squares can be left open or filled with marbled or decorated glass.

False rebates, in which the putty and glass rests, can be made from 1-in. by  $1\frac{1}{2}$ -in. wood strips tacked on to the inside edges of the framing.

Pergola or rustic poles are easy to erect and can be formed into attractive designs. The supporting pieces should be selected from poles having a thickness at the base of at least 3 to 4 in.

To provide shelter from strong sunlight, a simple roof may be erected: arrange lengths of strong timber, on edge and spaced about 2 ft. apart, to run from the wall of the house to the edge of the patio. At the wall end fasten the timber to a strong beam that has been Rawl-bolted into the wall. At the other end support the cross pieces on a similar strong beam. Use posts about 6 ft. apart to support the front beam.

Use substantial timber, about 3 in. by 6 in., for this kind of feature. Secure fastening is important, and it is advisable to use threaded bolts. Trailing plants trained over this type of cover will not only provide additional attraction, but



Four types of timber fencing: all except hurdle can be creosoted or treated with a wood preservative to increase their durability

also some shade and privacy. Glass can also be used as a roof cover, and strong glazing bars 3 in. by 2 in. should be used. Green-shaded or marbled glass is ideal.

The screening material of the patio can be let right into the flooring or supported in a low wall, constructed with coloured slabs. If the wall is of cavity design, it can be planted up with flowers which will give a bright display at the foot of the screen during the summer months. Trailing and climbing plants can also be established in the cavities.

### PERGOLAS

A pergola formed by a series of arches can take the form of a covered walk, or it can be constructed to provide attractive screening or partitioning. Although pergolas are usually made of larch or pine poles, they can be constructed with thick baulks of timber about 4 to 6 in. square, or as a double row of brick pillars, with very thick lengths of timber (9 in. square) secured at the top and lying across the pillars to form a "roof".

A pergola constructed from larch or pine poles should have a simple design; too many fussy details can result in a weak structure. Use poles having a minimum cross-section of  $2\frac{1}{2}$  to 3 in. for the uprights, and insert them 2 ft. into the ground. The tops and cross-pieces should be nearly as thick and strong, but the decorative filling-in can be a little less substantial—a thickness of about 2 in. is enough.

A pergola looks attractive clothed with creeping or trailing plants. When arches are made, allowance must be made for the growth of the plants so that one can walk through without the plants causing annoyance. A height of 8 ft. is adequate. Nail the pieces of pergola carefully together and, where they meet at the angles of the framework, cut the ends to fit neatly and securely.

The simplest design for an archway consists of two rows of strong uprights firmly anchored into the ground and spaced about 6 to 8 ft. apart, with the rows far enough apart to accommodate the pathway. Fasten a series of poles across the tops of these uprights and parallel to the run of the path. Before they are fixed in position, make quite sure that all the uprights are the same height and perpendicular.

Construct the "roof" with a set of poles cut so that they overhang the width of the path by a foot or so each side. Nail each length to the top of the structure.

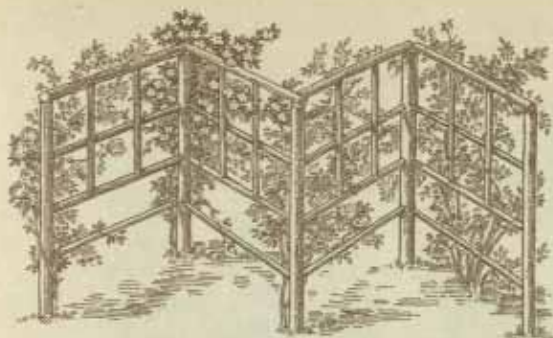
On each side of each upright, fit short supporting arms screwed into position about 2 to 3 ft. below the tops and forming a triangle with the long run of poles, again about 2 to 3 ft. away from the tops of the uprights.

More ornamentation can be incorporated, but this basic design is simple to build and pleasant to look at.

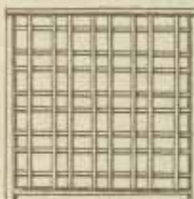
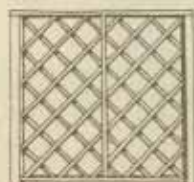
A pergola need not be an archway. It can consist of a single line of posts spaced about 6 to 8 ft. apart with a series of horizontal pieces forming a continuous top rail. It can be embellished with smaller pergolas, used to divide off parts of the garden or to form secluded areas for sitting out.

Archways, covered ways and screening can be made up with ordinary timber approximately 3 to 4 in. square. The most effective timber to use is western red cedar which is easy to work and most attractive in colour. It requires no painting or preserving and will last many years without attention. Its delightful warm, red colour blends in admirably with any type of garden, and even if it is allowed to weather to a silver-grey (this will happen if it is not initially treated with either clear varnish or linseed oil) it will still retain its unique character.

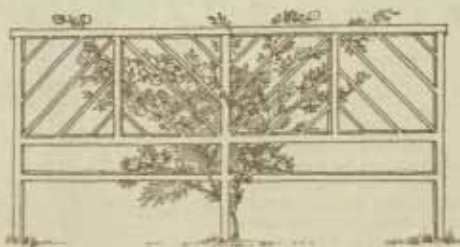
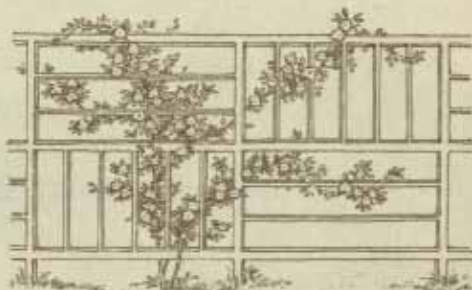
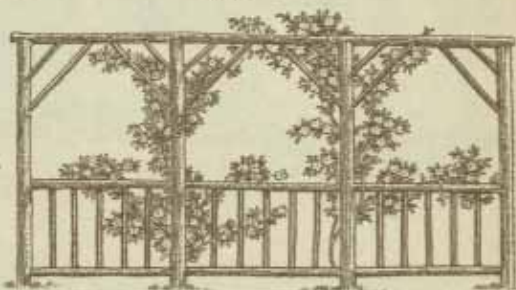




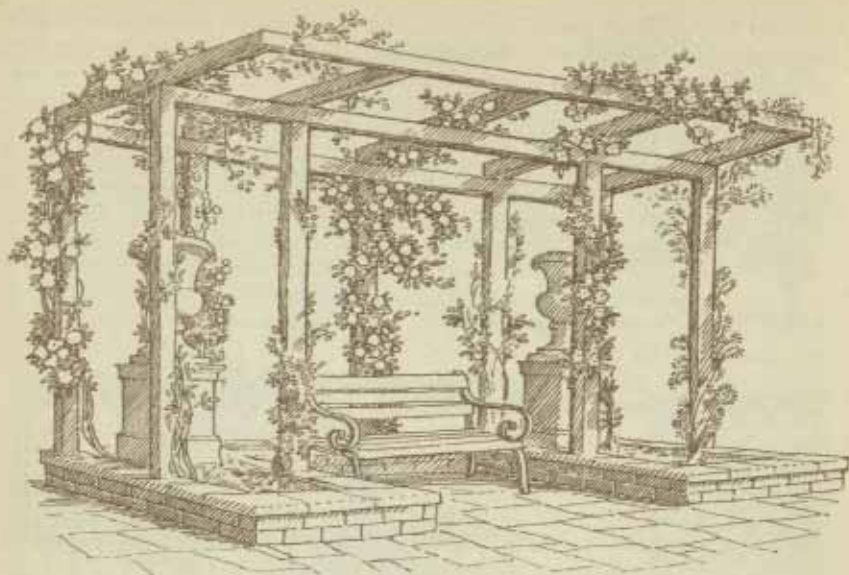
Larch is an ideal wood from which to make screening, as it has straight growth and retains its bark. To prevent rot, stand posts that are to be buried in the ground in wood preservative for several hours before erecting them



The appearance of trellis can be given more interest if the laths are positioned diagonally or given variable spacing. If it is attached to a wall, the trellis should be held off the surface so that plants can twine round the laths



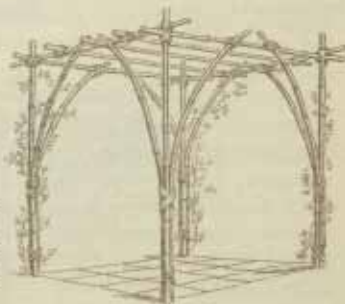
Endless variations in design are possible for screens on which roses or other climbing plants are to grow. These trellises are made of softwood, and should be painted or treated with preservative



A cantilevered wooden structure provides a canopy over a garden seat and gives a framework on which plants can climb. Flowers grown in the urns and raised beds will also add colour and variety to this terrace, which would serve as an ideal focal point for a large garden.

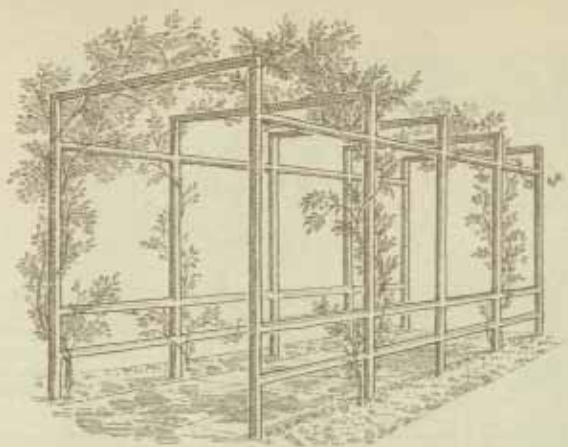


This dome-shaped shelter is not too difficult for a home handyman to erect if the supports, which consist of three hoops of heavy-gauge rod, and the circular metal strip that holds them in place, are shaped by a blacksmith. The dome can be filled in with lattice work.

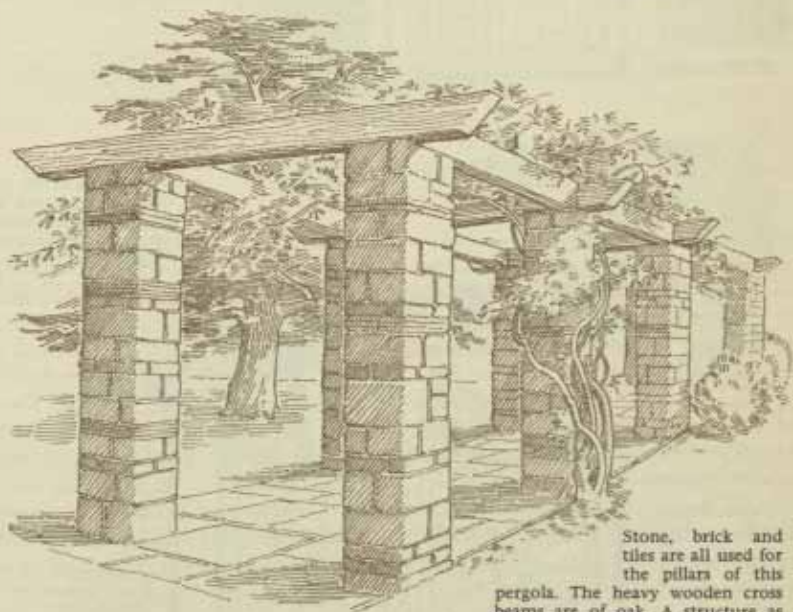


Bamboo held together with cord makes a simple pergola that can be used as a temporary structure for supporting annual climbing plants. As the curved bamboos are under stress, they should be screwed as well as tied in position.

## GARDEN CONSTRUCTION



A light pergola of soft-wood painted white. To keep it looking trim, re-paint the structure each spring before plant growth is too far advanced

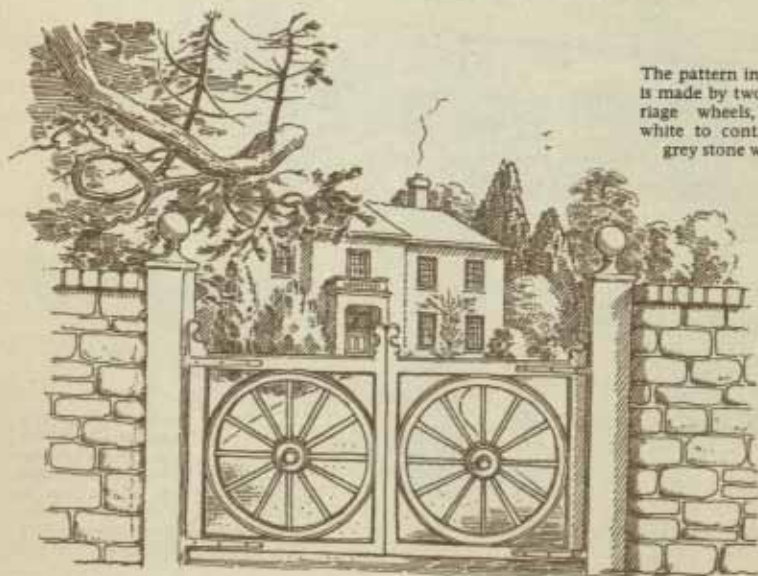


Stone, brick and tiles are all used for the pillars of this pergola. The heavy wooden cross beams are of oak. A structure as massive as this is necessary to support wisteria, which can become very large as it ages





Tall gateposts surmounted by a cross-piece have turned this wooden gateway into an attractive arch, used to support a wisteria



The pattern in this gate is made by two old carriage wheels, painted white to contrast with grey stone walling



A picket gate and fence painted white are particularly suited to a background of evergreens. Both fence and gate are simple to construct

## GARDEN GATES

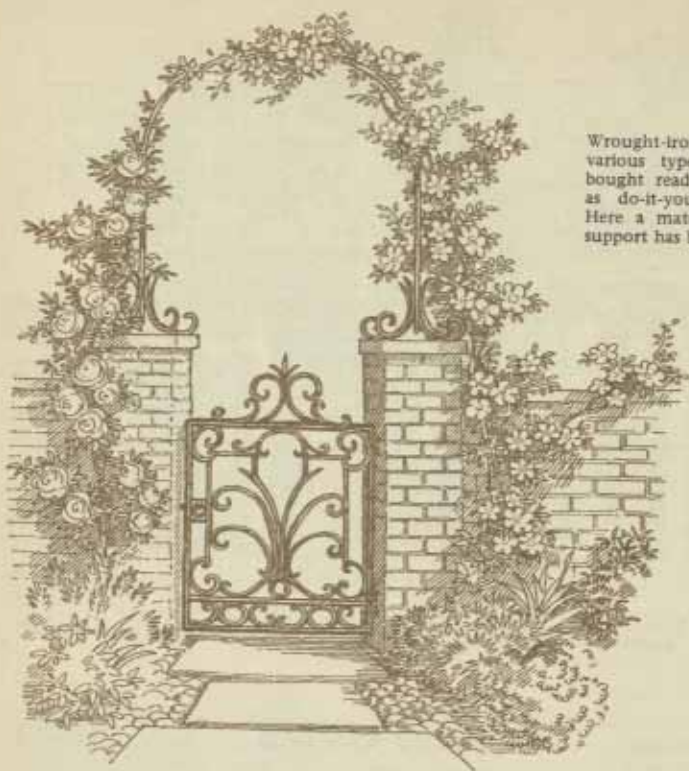
Well-designed gates add much to the appearance of a house and garden. A great variety of designs is available, either simple or fairly complicated and in wood or metal.

Timber gates can be attractive; cedar wood and oak are the most durable woods to use. Wrought-iron gates are light, yet are still very strong.

Many new estates are open-planned, often with gardens having only low boundary walls, and gates would look rather odd when attached to tall pillars or posts that are considerably higher than these walls. Panels of wrought ironwork or wooden fencing can be attached to posts let into the top of the walls. This would avoid the height disparity.

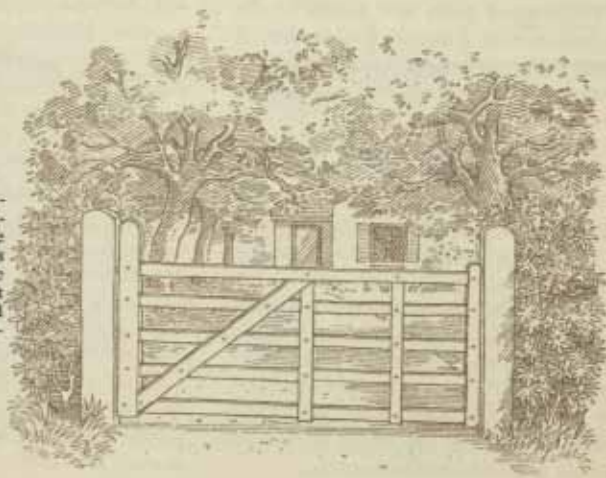
Do-it-yourself gate kits can be bought and easily assembled at home with simple tools. There are kits of wrought-iron gates specially designed to suit every type of garden and home; they can be assembled to suit the width of the gate opening.

Supporting-posts for gates should be set in the ground very securely, as a great deal of strain is placed on them. Hinges should be firmly fixed. Where existing brickwork pillars are used, the usual method is to Rawlplug the screws or bolts into position. If the wall is being built at the same time, use the type of special hinge that has a flat plate or tongue cemented into the brick courses as work proceeds.



Wrought-iron gates of various types can be bought ready-made or as do-it-yourself kits. Here a matching rose support has been added

A variation on the traditional five-bar gate. Suitable for almost any type of background, this style of gate can be painted white or left untreated if it is a wood with an attractive texture such as cedar





## BUILDING BRIDGES

Over a garden pool or in a rock garden or other suitable setting, well-designed bridges can look charming. Their construction need not be complicated, although strength is most important.

A bridge should look natural in its surroundings, so try to incorporate a little of the design work and material of the bridge into its surroundings. If, for example, the bridge is covered with crazy paving, insert a few stepping stones of crazy paving in the garden at the immediate approaches to the bridge.

An attractive bridge can be constructed entirely of wood. Make the basic supports of beams at least 6 to 9 in. square, and treat them with a good wood preservative. Stand the ends, which will rest on either bank, in a preservative for at least 24 hours to impregnate the wood thoroughly.

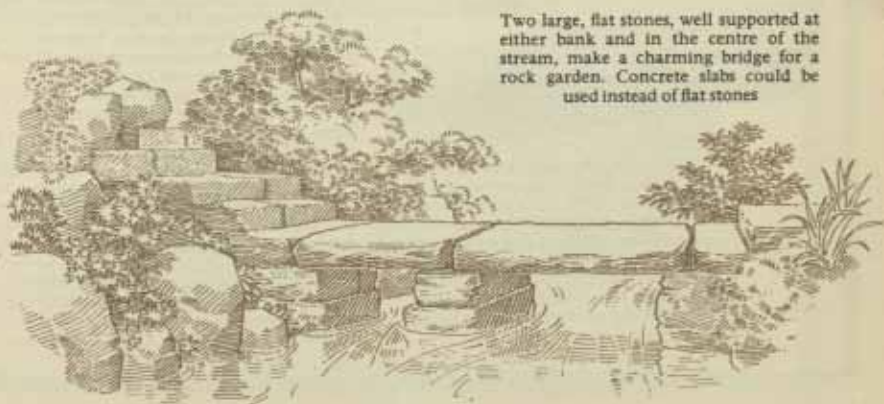
Cut the supports to length (that is, the length of the span plus 4 ft. so that 2 ft. can be let into the bank at each end). The supports can be retained by sinking Rawlbolts of suitable length into a bed of concrete (1 part cement to 4 parts sand).

Drill holes in the ends of the supports to take the bolts, and fasten them down securely with washers and nuts.

To surface the bridge, screw  $1\frac{1}{2}$ -in. thick planks on to the beams and at right angles to them. Use brass screws because they will not rust.

A simple handrail can be constructed for this type of bridge. Cut the upright supports for the rail from 3-in. square timber to support the rail at a height of about 3 to  $3\frac{1}{2}$  ft. above the bridge. Allow sufficient length for them to be bolted through the supporting beams below. Space the supports not less than 3 ft. apart. The top rail should be made from timber 3 in. by 2 in., and the corners carefully planed or sanded smooth.

To provide additional strength to the handrail, bolt or screw a piece of 3-in. square timber into the bottom of the supporting beams underneath the middle of the bridge, to extend 3 ft. beyond each side. Fix a length of timber to the end of this beam and to one of the rail uprights just below the handrail; this will give triangular strength to the structure.

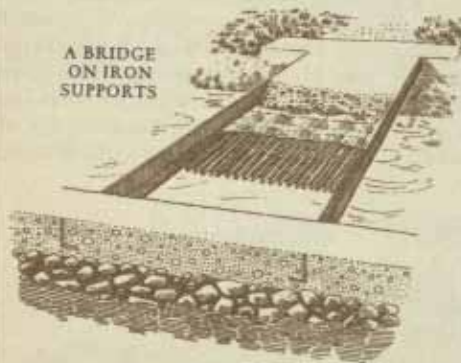


Two large, flat stones, well supported at either bank and in the centre of the stream, make a charming bridge for a rock garden. Concrete slabs could be used instead of flat stones

Supports for this two-plank bridge are H-shaped structures, firmly sunk into the bed of the stream. Large pebbles and reeds at the water's edge help the impression of naturalness.



A BRIDGE  
ON IRON  
SUPPORTS



The easiest bridge to construct is the flat type, which is really a supported path. Use angle irons, about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. thick and  $\frac{3}{4}$  to 1 in. wide, as supports. Usually two lengths will be sufficient if the width of the bridge does not exceed 3 ft. and the length is not more than 6 ft. To build a larger bridge, the number of supports can be increased or thicker and stronger angle iron can be used.

Reinforce the banks with plenty of rubble and a layer of concrete  $\frac{1}{4}$  in. thick. A suitable concrete mix for this purpose is 1 part cement to 6 parts mixed ballast. As this mixture is laid, let the ends of the angle iron supports into the wet concrete and bury them completely, with the angle at the bottom. Take great care to check that the two pieces of angle iron are parallel before the concrete is placed in position; a suitable width will be 2 $\frac{1}{2}$  to 3 ft.

Form the base of the bridge with wire mesh reinforcement, bought from an ironmonger or builder's merchant. A mesh with a thickness of  $\frac{1}{4}$  in. is suitable. Cut it to width so that it drops inside the angle irons and rests in the angles. When cutting the length, allow an extra 4 ft. so that 2 ft. can extend on to each bank.

When the mesh is cut, apply a layer of concrete into the angle of the angle iron supports so that the mesh can be dropped into position and embedded well into this concrete. When this has set thoroughly, lay thick brown paper, cut to size, over the mesh and cover it with more concrete, level with the tops of the angles. The paper is to prevent the

This simple plank bridge is supported in the middle by a length of tree trunk. Added strength is given to the structure by sinking the end supports of the handrail into the banks of the stream; like the centre post, they are also screwed to the plank.



concrete falling through the meshes; it will rot away, but not before the concrete has set hard. The mix for the concrete should be 1 part cement, 3 parts sand.

Finish off the bridge by smoothing the concrete filling carefully with a trowel. To enhance the appearance, colouring powders may be added to the concrete when it is mixed.

Other materials can be used to give the surface a more natural appearance. Score the cement filling or leave it a little rough to provide a key for the further concrete that will be required for bedding down the surfacing material.

Crazy paving gives a most pleasing appearance (right). First lay the stones loosely on the bridge as a trial; when a good-looking, well-fitting pattern has been arranged, number the stones so that they can be laid easily and quickly in their cement base. Let the stones overlap each side of the bridge by about 1 in., to hide the angle-iron supports below.

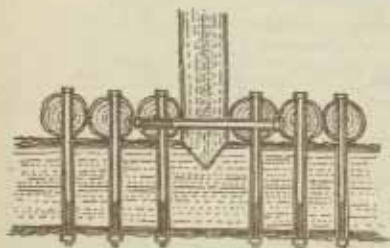
Use the following mix to bed down the stones: 1 part cement, 4 parts sand. Make sure each piece is firmed well into a 1-in. layer of bedding cement, and is level. Later cement in all the joints flush with the tops of the stones.

Using the same laying process, coloured slabs of two or three different sizes can be arranged to form an attractive pattern. Old bricks can be set either on edge or flat, again using a variety of patterns to provide pleasing designs. Pebbles might be used, but it is perhaps wiser to make the bridge a safe treading place, by using flat surfacing material.

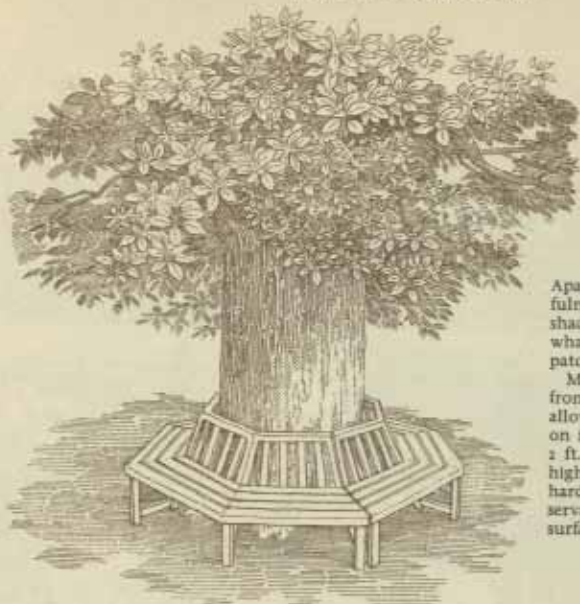




A LOG BRIDGE



A most natural-looking bridge can be constructed of well-seasoned logs. The supporting logs for the bridge should be at least 1 ft. in diameter and the logs used for filling in should be at least 6 in. thick. Secure fastening is essential; the best method is to use long bolts, inserted after the logs have been drilled

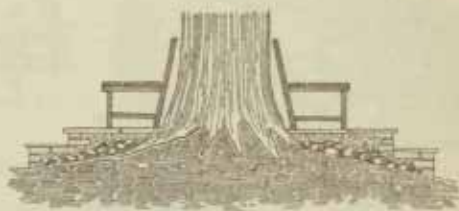


## TREE SEATS

Apart from its charm and usefulness as a resting place in the shade, a tree seat helps to hide what can be an unsightly bare patch at the base of a large tree.

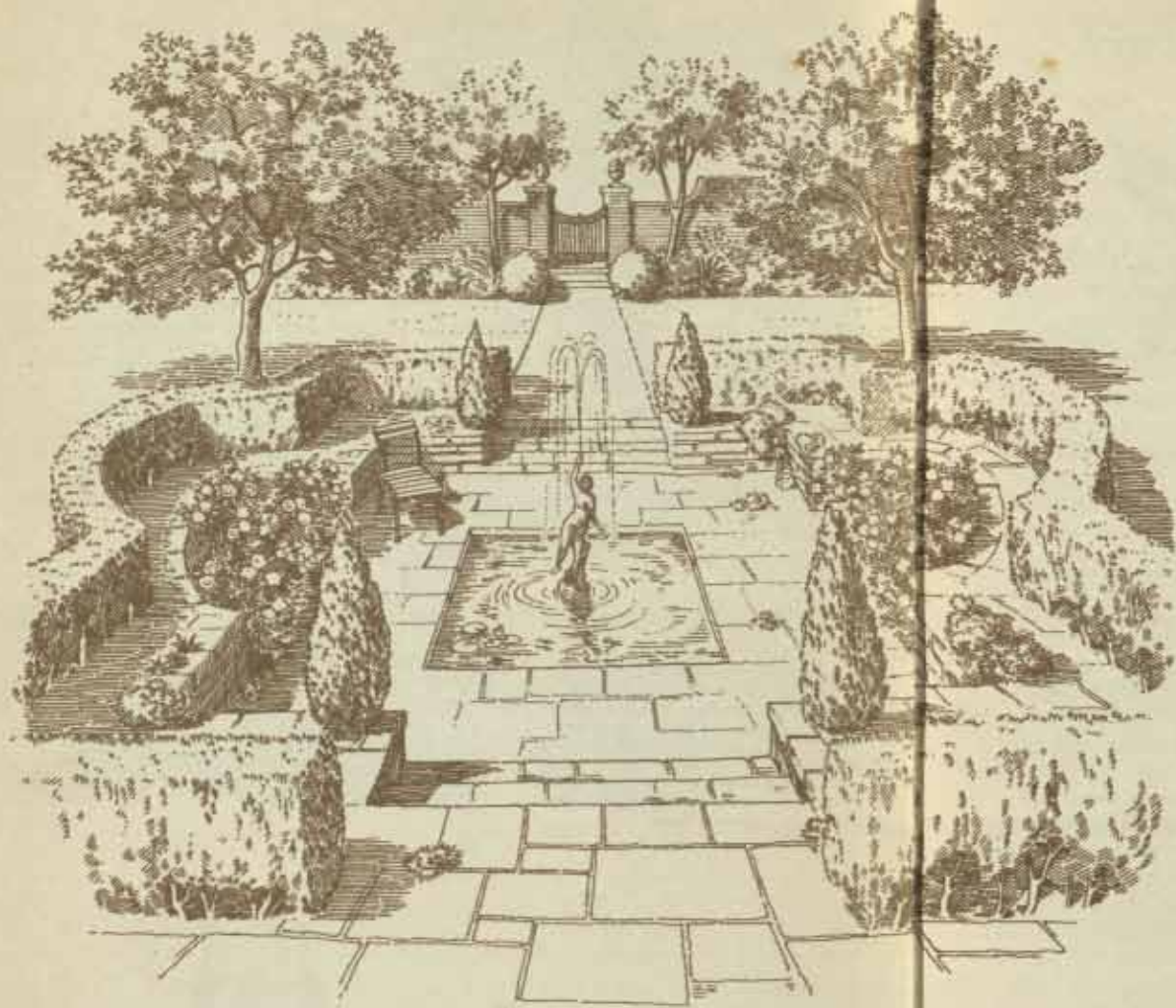
Make the seat level 12 to 14 in. from the ground, a height that allows for cushions to be placed on it; the seat should be  $1\frac{1}{2}$  to 2 ft. deep, and the back  $1\frac{1}{2}$  ft. higher than the seat. Slats of hardwood, treated with preservative, make the best seating surface as they allow rainwater to drain quickly.

If the tree seat is to stand on its own legs, a level surface, perhaps paved like a patio, will be necessary. Make the seat in two semicircular sections that can be moved apart as the tree grows. Each semicircle may be composed of three sides of a hexagon or four sides of an octagon to avoid the necessity for curved wood.



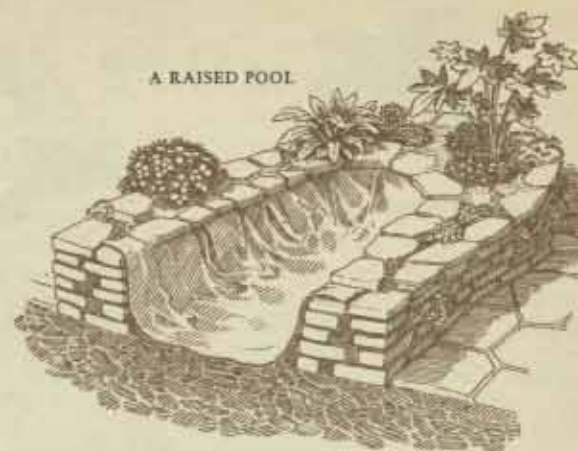
If the tree is fully grown, the tree seat framework can be screwed straight on to it with 6-in. screws. A hexagonal or octagonal shape is best, and if the seating surface, the back and a stay to the front of the seat make up a triangular shape, the structure will be firm enough not to need legs at the front. When the seat is fixed to the tree in this way, it is unnecessary to level the surrounding ground.





A SUNKEN GARDEN

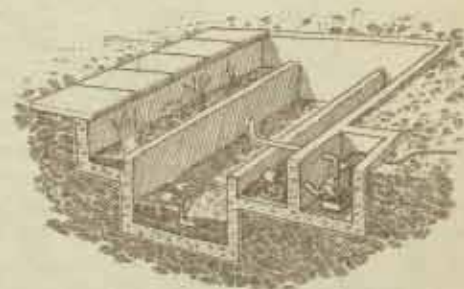
A very uneven site requiring a great deal of earth-moving is often ideal for the creation of a sunken garden. Here, a sunken rose garden has been made in a symmetrical shape with stone paving and walls. A lavender hedge round the whole feature gives shelter from the wind. Herbs are planted in the stonework to provide a sweet scent, and spring-flowering trees overlooking the garden add lightness and shade.



A RAISED POOL

Heavy-gauge plastic sheeting makes a pool that can be quickly erected. The stone and earth walls are planted with alpines, and the top row of the inner stone wall hides and holds in place the edges of the transparent sheeting. The plastic stretches a little to take the shape of the earth base beneath it. When the pool needs emptying, the water may be siphoned out.

A CONCRETE POOL



This small concrete pool has a deep centre, and side areas at a higher level where shallow-water aquatics may be grown. In a separate watertight compartment, an electric pump (which will be covered by an edging stone) pumps water from the bottom of the pool through a pipe connected to a decorative fountain standing in the pool.





HOUSE MARTIN



SWALLOW



ROBIN



HOUSE SPARROW  
female



HOUSE SPARROW  
male



CHAFFINCH

# Animals, Birds and Insects in the Garden

EVERY GARDEN is in its small way a microcosm of the animal kingdom, and to be able to recognize the various creatures it harbours adds greatly to the pleasure of gardening. Some of the animals are, of course, implacable enemies of the gardener, to be exterminated if possible; others remain in peaceful co-existence, feeding upon pests, pollinizing, scavenging or even, as in the case of the earthworm, aerating and improving the soil.

Whether they are friends, neutrals or foes, the discovery of them will depend partly on how much they reveal themselves, though it will depend chiefly on the evidence they leave behind them of having been in the garden.

In the countryside the distribution of wild plants and animals is not so random as may at first appear, for there is generally a close relationship between the type of soil and the plants which thrive on it.

The types of plants and trees which grow in any locality tend to determine the species of insects to be found, and the insect life may have a bearing on the bird and animal life. This close relationship between the various forms of plant and animal life exists naturally in virgin soil,

but is inevitably disturbed when the ground is cultivated.

Some species of animals, birds and insects are extraordinarily adaptable and can live happily in a wide variety of habitats. House sparrows, for instance, will thrive in any place where there are adequate scraps or seeds to support them and holes for them to nest in; and even if there are no suitable nesting holes they will manage quite happily by building ragged grass nests in trees.

Other species may be much more specialized, requiring certain conditions for survival; the lime hawk moth lays its eggs on lime trees and very occasionally on elms, so its distribution is limited by the distribution of its food plants. Swallows and house martins cannot breed in areas where there is no mud available for nest building.

Mature gardens with hedges and trees, shrub gardens and wild and untended corners will be infinitely richer in animal life than well-cared-for plots surrounded by bare fences or by chain mesh. The addition of even a small pond may almost double the variety of creatures to be found, for many different forms of life will colonize it in the course of a few years

## MAMMALS

Although mammoths, wolves, bears and woolly rhinoceroses once roamed Britain, today few wild mammals remain and only a handful of them are regular inhabitants of gardens.

With the exception of the squirrel and the hedgehog, which readily become tame, mammals in general have not developed the easy relationship with man which so many birds seem to show. Their

presence is much more furtive, often because the gardener cannot meet them on friendly terms. The mole which ruins a favourite lawn or the rabbit which devastates the vegetables must be got rid of, and once an animal has been driven from an area recolonization is a much more precarious and lengthy business than it is with birds or insects.

The position of the garden is therefore a factor which determines the number of mammals that visit it. Those gardens which back on to woods, commons or any other type of open country will be visited by more animals than the small suburban garden, but few gardens are entirely without a mammal of some kind, even if it is only the house mouse.

Because of their retiring ways and nocturnal habits it is easy to be unaware of mammals in the garden. Only the bats, sharing as they do the mobility of birds and insects, seem indifferent to the nature of the garden and on summer evenings may be seen flying over the centre of quite large cities.

#### MOLES

It is possible to spend a lifetime in the country without seeing a live mole, but there is little chance of one living undetected in the garden, for its handiwork



MOLE

—the mole hill—is unmistakable. The mole is about 6 in. long, with beautiful soft velvety black fur, a long pointed snout, and broad immensely strong forepaws. Its eyes are small and set deep in the fur, but as most of its life is spent underground, sight is of little importance to it. It has, however, an acute sense of smell, much used in hunting. It feeds chiefly on earthworms, which it obtains by endless burrowing operations. The ordinary mole hill is the spoil from the burrows. The nest chamber lies beneath a much bigger hill and is an elaborate structure with several exits. The young are normally born in May or June.



HEDGEHOG

#### HEDGEHOGS

These small animals are welcome in the garden, as they live mainly on snails, slugs and insects. They feed chiefly by night, lying up during the day, and this routine enables them to live even in the suburbs. They readily become tame enough to feed on bread and milk if it is put out each evening.

The spines of the adult hedgehog are darkish brown with lighter tips, and their underparts are covered in brown fur. Unfortunately their long spines (really modified hairs) frequently harbour many fleas, and a flea powder should be used before they are handled.

The spines of newly-born hedgehogs



are pale and soft and take about three weeks to harden.

Litters number from four to seven and are born in summer, some sows producing two litters a year.

In winter the hedgehog hibernates in a bed of leaves and moss in a hole in a bank or among rocks, under the roots of a tree or even in a little-used building, but occasionally it stirs abroad on particularly mild nights.

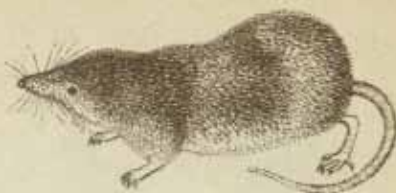
#### SHREWS

Occasionally shrews may visit the garden or be brought in by the cat. Although superficially similar to rodents they are in fact insect-eaters, related to the mole and hedgehog, and are therefore helpful to gardeners. They are very small animals with long tails, flexible pointed snouts and small ears. The body of the pygmy shrew may be only  $2\frac{1}{4}$  in. long, and that of the common shrew only 3 to  $3\frac{1}{4}$  in. long. They are fierce little bundles of energy, and live at such a pace that they have to feed throughout the whole twenty-four hours of the day.

In colour, they are dark brown above and whitish below.

#### BATS

These are mammals which have become adapted to true flight by a great exten-



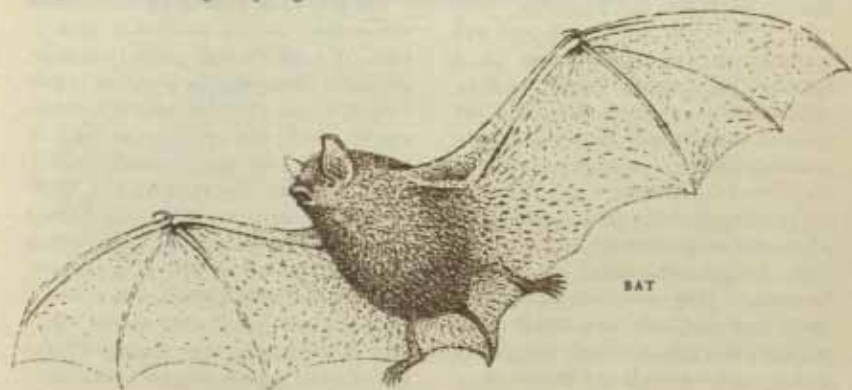
COMMON SHREW

sion of their finger bones and the growth of a leathery membrane connecting the fingers to each other and to the body. They hunt chiefly at twilight and feed on insects which they catch on the wing. They have exceptionally acute hearing and use a system of echo-sounding to navigate with phenomenal accuracy in the dark.

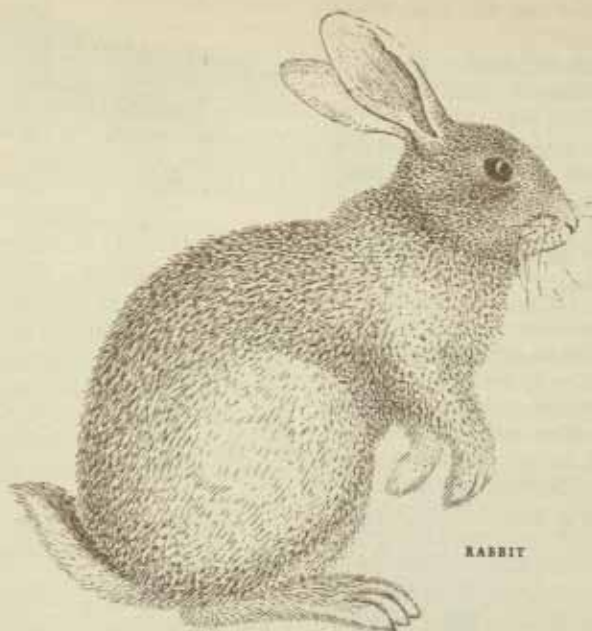
In winter they hibernate in caves, hollow trees and old buildings but may come out in mild weather.

There are twelve species of bat in the British Isles but some of them are very local or rare.

The pipistrelle (wing span 8 in.), the long-eared (10 in.) and the noctule (15 in.), are the most widely distributed. Identification is, however, difficult as their colour varies with the species and even within the species. They are normally seen as silhouettes in the dusk.



BAT



RABBIT

## RABBITS

These have become much less common since myxomatosis spread through the country, and although disease-resistant populations are developing, there are still large areas where the animal is rare or even unknown.

But rabbits are very fertile and will certainly survive myxomatosis as a species. The disease is spread by fleas, which, in the crowded conditions of the warrens, pass easily from one animal to another. There is evidence, however, that some animals are now spending their entire lives above the ground and so, for a time at least, are thriving.

In the garden, rabbits are a great menace. If they are abundant in the neighbourhood only an elaborate wire-netting fence sunk well into the ground is likely to keep them out effectively.

## SQUIRRELS

Two species of squirrel can be found in the British Isles—the native red squirrel and the North American grey squirrel which was introduced at the end of the last century.

The grey squirrel frequents deciduous woods, but the red squirrel is most at home in conifer woods and is thus commonest in the north, the west, and in East Anglia, where conifer woods predominate. Where the two species meet the grey squirrel tends to oust its smaller cousin.

Both species are rodents and build bulky nests or drays. These are domed structures of twigs and dead leaves which serve as a home as well as a nursery. Squirrels gather in considerable stores of food because, though they do not hibernate in the winter, they venture abroad less often in periods of severe weather.

The coat of the red squirrel varies in colour during the year, and assumes a greyish tinge by the end of the winter. This is due to moults, which occur in May and October, and to bleaching. The tail becomes progressively creamier as the season advances. The pointed hairy ear-tufts are an attractive feature. It lives on nuts, fruit, bark, seeds, fungi and occasionally birds' eggs.

The grey squirrel, frequently known as the tree rat, is light grey in colour and may readily be distinguished from its relative because it has no ear-tufts. It is ruthlessly persecuted in some areas, as it takes young buds, fresh shoots and grain for food. In general, gardeners have little to fear from the grey squirrel although it will raid the bird table.

#### OTHER RODENTS

Rodents are principally vegetarian and are therefore bound to come into conflict with gardeners. Fortunately, apart from the introduced coypu, British rodents are small, the rat being the largest species



HOUSE MOUSE

likely to visit a garden. Other probable visitors or residents are the house mouse, the long-tailed field mouse, the bank vole and the field vole.



LONG-TAILED FIELD MOUSE



RED SQUIRREL

The first thing to look for in identifying all these small creatures is body shape. Rats and mice have long, pointed noses, long, prehensile tails and big ears. Voles are squatter animals, rather like hamsters, and have round heads, small rounded ears and short, rather stiff tails.

The appearance and habits of the house mouse and the brown rat are familiar to most people, and are therefore not described here.

The long-tailed field mouse is much the same size and shape as the house mouse, although its tail is a little shorter, and its ears (which are pink inside compared with grey-brown in the house mouse) are a little larger. It is a warmer brown and is further distinguished



by its whitish underparts. It is a most destructive creature in the garden, being especially partial to peas, fruit, bulbs and grain. In winter it readily makes its home in outbuildings or even in the house. In summer it is more likely to be found along the hedge bottom or in similar places.



BANK VOLE

The bank vole and field vole can be distinguished by size, colour and tail length. The bank vole measures about  $3\frac{1}{2}$  in. without the tail, the tail adding another  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. Its upper parts are bright reddish-brown, shading to grey on the flanks. The field vole, also called the short-tailed vole, is slightly bigger, but has a much shorter tail and is a duller, rather mousy brown.

As its name implies, the field vole is more a creature of the open fields while the bank vole is more at home in woods and hedge banks.

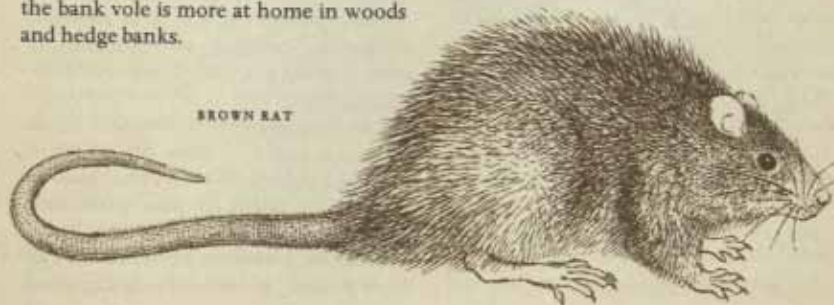
Both voles will live quite happily in large gardens, where they may do considerable damage, taking leaves, stems, roots, bulbs, fruit and seeds. They make long runs among the roots of grass, and the nests, in which the young are born, are placed on or above the ground. Both species lay in considerable stores of food in their burrows and in winter spend much more time in them. Neither species is found in Ireland.

#### STOATS AND WEASELS

Both these animals are closely related to ferrets, mink and sable. The stoat, at  $12\frac{1}{2}$  to 14 in. long, is appreciably bigger than the weasel (8 to 10 in.) with a proportionately longer, black-tipped tail. Its upper parts are a darker brown than those of the weasel, and its underparts are not so white. Both have long sinuous bodies and are extremely fierce: a weasel can bite right through thick leather gauntlets. In addition they defend themselves by emitting an unpleasant smell.



FIELD VOLE



BROWN RAT

STOAT



WEASEL



Both species live in burrows, not necessarily of their own making, and pursue their prey underground.

The weasel takes many small rodents and rabbits for food and so should be welcome in the garden.

Stoats are persecuted by game keepers because of the readiness with which they

attack game birds; on occasion they will also enter hen houses.

The stoat bears the fur known as ermine, but it is generally only in the north of Great Britain that it moults into this white winter coat which is of poor quality.

The best ermine comes from abroad.

## AMPHIBIA

Amphibians are cold-blooded vertebrates or back-boned animals which occupy a position half-way between the entirely aquatic fish and the terrestrial reptiles and mammals.

They lay their eggs in water, and the young pass through a tadpole stage during which they breathe by means of

gills—they would die if left in the air. Later, they develop normal lungs, the gills disappear, and the amphibians take to the land, but even then they must return to the water to breed. Because of this need for water, they are most likely to be found near ponds, ditches or very slow-flowing rivers.



COMMON FROG

The amphibians in Great Britain are the common and the edible frog; the common and the natterjack toad; the common or smooth newt, the palmate and the crested newt. There are no edible frogs, toads or crested newts in Ireland. The common frog was introduced there in the 18th century and is now common.

## FROGS

The edible frog was introduced from the Continent and is now fairly common in south-east England. As its name suggests, this is the creature which provides the French delicacy "frog's-legs". It may be distinguished from the common frog by the presence of a light green or yellow line down the centre of the back with, usually, a brownish line along either side. A further identifying characteristic is that the top of the thigh is spotted with black and yellow. It measures a little over 4 in. and is slightly larger than the well-known common frog. There is a characteristic hump on the back in both species.



EDIBLE FROG

Frogs will breed in any pool, however temporary, and up to 2,000 eggs are laid by each female every spring. These are small when laid, but quickly absorb water and swell to form a shapeless mass of spawn.

Frogs live on insects, worms and slugs and so it is well worth trying to make the garden attractive to them. A pond is, of course, the surest means of attracting them, but even then a pair may have to be introduced in the first instance. If this is attempted, remember that male frogs are a good deal smaller than the females. In the absence of a pond, frogs will seek patches of long damp grass, rhubarb beds and other moist places where they can shelter from the sun.



NATTERJACK TOAD



COMMON TOAD

## TOADS

Toads may be distinguished from frogs by their dry, warty skin, their flat backs without the hump of the frogs, and their shorter hind legs. They are generally smaller than frogs, males being about 2½ in., females 3½ in., and very occasionally even 4½ in. The natterjack toad, which does not exceed 3 in. in either sex, has a





PALMATE NEWT, male

SMOOTH OR COMMON NEWT  
female

CRESTED NEWT, male

thin yellow line down the centre of the back. It runs rather than hops and calls loudly during April, May and June.

Toads prefer deeper, more permanent water for breeding than frogs and will travel several miles across difficult country to a favoured site. Their spawn is laid in long strings.

Like frogs, toads are entirely beneficial in the garden, living on caterpillars, slugs, woodlice, millipedes and insects. They feed at dusk and like to spend the day in the shade of a plant, frequently achieving remarkable camouflage by scooping out a shallow hole in the soil so that their rough backs blend with the surrounding earth.

#### NEWTS

In appearance newts resemble small lizards. They are much more aquatic than frogs or toads, spending most of the spring and summer in the water. When they finally leave their breeding pool in the autumn, they do not wander very far away; after a brief while they seek a hole or crevice near the water and hibernate until the spring. This means they are unlikely to be found in gardens that have no pond near by. If they are introduced to a garden pond it is necessary

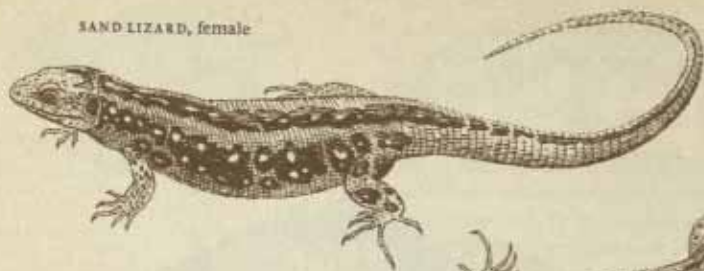
to make sure that no overhanging lip prevents them from leaving the water when they wish.

Newts lay their eggs singly, attaching them to the leaves of water plants, and it is easy to overlook their presence as there is no conspicuous mass of spawn to identify them.

Like frogs and toads, newts are insectivorous and an asset to the garden.

During the breeding season the males have bright orange underparts and develop crests, but do not assume that a newt with a crest is necessarily a crested newt, which is the largest of the three newt species. The crested newt grows to 6 in. and both sexes have big serrated crests running down the centres of their backs. The common or smooth newt reaches 3 to 4 in. and the palmate newt is slightly smaller. The palmate is so-called because in spring the hind feet of the male are webbed. But it is safer to recognize it by the rather square-cut appearance of the tail, from which projects a black central thread, as this feature remains throughout the year, whereas the webs on the hind feet are much reduced by the time the animal leaves the water after the breeding season.

SAND LIZARD, female



COMMON LIZARD, female



## REPTILES

Like the amphibians, reptiles are cold-blooded; that is, they do not maintain a constant body temperature but take on that of their surroundings. They are most active in warm weather and become increasingly lethargic as the temperature drops, until, in cold weather, they become completely torpid. They are able to hibernate through long winters, the viper or adder being found nearly as far north as the Arctic Circle. There are no snakes in Ireland.

The reptiles to be found in Great Britain are three species of snake—the grass snake, the adder and the smooth snake; two lizards—the common and the sand lizard; and the slow worm—which looks like a snake but is really a legless lizard.

Young reptiles hatch out from eggs which are not incubated by the parent. The fertilized eggs of the adder, smooth snake, common lizard and slow worm are retained within the body of the female until they are just about to hatch, and the young are therefore born alive. The eggs of the other British reptiles are

hatched by the heat of the sun and the warmth generated by decaying vegetation. For this reason a compost heap is sometimes a special source of attraction.

Most reptiles prefer fairly dry conditions and are often associated with heathland. The grass snake, which is fairly catholic in its choice of habitat, is the species most likely to be found, but none of the reptiles is common in gardens, and the smooth snake is very rare, being confined to a few areas in southern England.

### SNAKES

The snakes of the British Isles live on a variety of food including small rodents, frogs, toads, newts, lizards, insects and occasionally small birds. They like good ground cover but on sunny days may bask in exposed places.

The grass snake is long and tapering, the females (which are bigger than the males) frequently reaching 4 ft. and occasionally 5 ft. It has black spots along its back and bars along its sides, and normally there are two distinctive yellow patches placed symmetrically just behind

the head though these may be missing in old females. It is an excellent swimmer and in summer may spend much time hunting in the water.

The adder is much shorter and thick-set, with a rather short, blunt tail, a broad flat head, and a very distinctive dark zig-zag line down the centre of its back. It is the only poisonous snake in Great Britain, its bite being fatal to dogs and occasionally to human beings. Fortunately, it very rarely attacks unless provoked.

#### LIZARDS

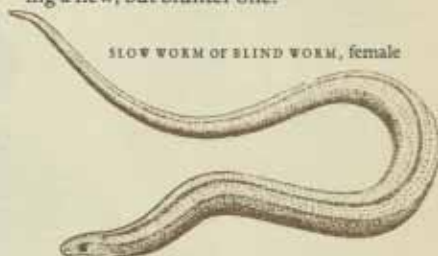
These small reptiles move with great rapidity, especially in warm weather, and can climb rocks and walls with ease. Unlike snakes, they have eyelids.

The common lizard is 5 or 6 in. long and is the only species likely to visit the garden. The underparts of the male are orange or red, dotted with black; the female is paler, with grey spots or is even unmarked. It feeds mainly on insects, caterpillars and spiders, and is most likely to be found on hedge banks, dry stone walls and in rock gardens.

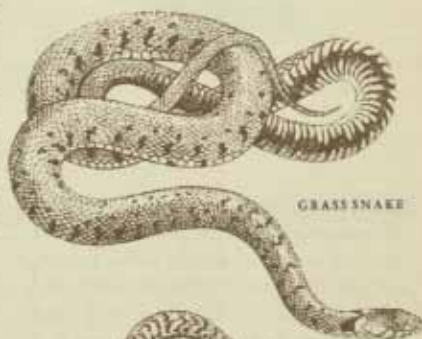
The larger sand lizard, 8 in. long, is rare, being confined to sandy parts of Surrey, Hampshire, Dorset and the coast of Lancashire. It is purple-brown with broken bands of a darker tint, but the colour is very variable and the males tend to have a green diffusion. There are rows of dark and white spots along the

back flanks and tail. Its food is much the same as that of the common lizard.

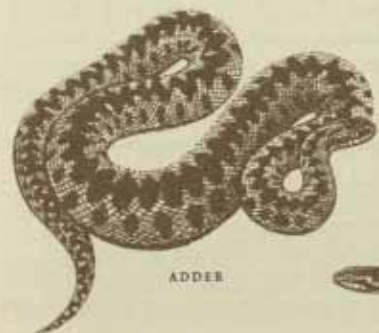
The slow worm, also known as the blind worm, is bronze in colour, slender, and is seldom more than 15 in. long. Like other lizards it has eyelids. It feeds on slugs, insects and worms and spends much of its time hiding away under large stones (the rocks in rock gardens attract it), fallen trees, sheets of corrugated iron and so on. If it is trapped by its tail the slow worm will readily shed it, later growing a new, but blunter one.



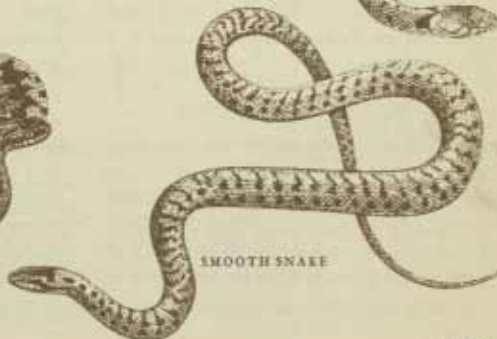
SLOW WORM OR BLIND WORM, female



GRASS SNAKE



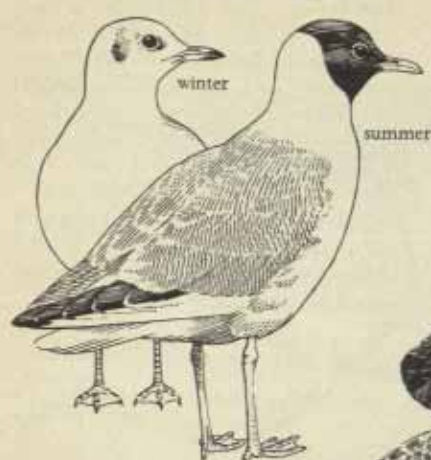
ADDER



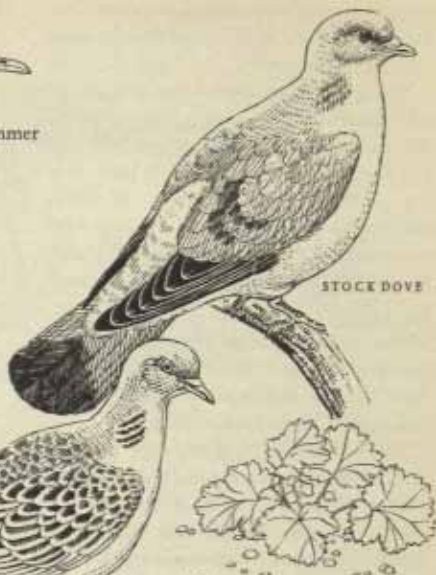
SMOOTH SNAKE



BLACK-HEADED GULL



STOCK DOVE



TURTLE DOVE



## BIRDS

Birds, with their incessant movement, charming habits and gay song, are a constant source of delight in the garden, and will often make it their home. In the migration season, even casual visitors can be attracted to the garden in search of food and water.

### FOOD AND WATER

An elaborate bird table is not necessary, for some of the shyer species prefer to feed from the ground. But if food is put out it is important to see that there is no place near by where a cat can lurk in wait for an unsuspecting victim. Pieces of fat hung from trees are a safe source of

food for the tit family. Finely chopped fat and other scraps are welcomed by most birds, as well as peanuts and seeds, which can be placed in holes made in the tops of posts. A small patch of chickweed or groundsel will soon be found by greenfinches and linnets. A clump of teasel at the end of a herbaceous border will not only look attractive but will tempt goldfinches. Berry-bearing shrubs and trees, such as holly, rowan, hawthorn and pyracantha, can make the difference between life and death for birds in severe weather conditions.

Water is important both for drinking and bathing. An elaborate bird bath is not

essential, but if birds are going to bathe as well as drink, the water should not be more than an inch or two deep. An old dustbin lid let flush into the ground makes an excellent bath. It is particularly important to see that water is available in frosty weather when natural sources may be iced over.

### NESTING

Birds like mature gardens, for a bare plot of annuals with few herbaceous plants or trees offers neither nest site nor shelter. Shrubs, hedges, fruit bushes, creepers and trees all provide places where the birds can take refuge when alarmed, or can roost at night, as well as providing opportunities for nest building. On the whole, natural sites are more important than nest boxes, so before cutting hedges in the breeding season it is as well to check that no bird is nesting behind the leafy cover. Nest boxes should be erected in north-facing or shaded positions to prevent the young from being baked by the sun. Sites between 4 ft. and 10 ft. high are preferable. Robins and spotted flycatchers like boxes with only the lower half of the front boarded. For tits the whole front should be closed in and an entrance hole of about 1½ in. in diameter made. If the hole is bigger, house sparrows are likely to commandeer the box. The inside should be about 4 in. by 4 in. with a depth of not less than 5 in. A removable lid will enable the box to be cleaned out at the end of the season. Tits often roost in nest boxes all winter so leave the boxes out all the year round.

### HINTS ON IDENTIFICATION

All identification is, initially, a process of narrowing down the field, whether it is to name one insect from a possible 20,000 or one bird from the 450 or so which have been recorded in the British Isles. The first step is to try to recognize the group

to which a bird belongs. Thus, as soon as it has been decided that a bird is an owl, the field has been narrowed down to about half a dozen species.

#### BILLS OR BEAKS

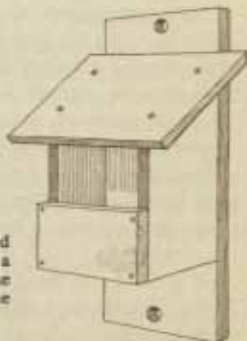
Often the shape of the bill is an important clue. A slender beak is an indication that the bird is an insect eater and uses its beak as a delicate pair of forceps. On the other hand, birds such as swallows, swifts and flycatchers, which catch their insects on the wing, have short, broad beaks which open wide and make it easier for them to scoop up their prey while flying at speed.

Woodpeckers have stout beaks with chisel-like ends to enable them to bore through the bark of trees for the insects lurking beneath, but a brown and white little bird called the treecreeper, which also seeks its food on tree trunks, has a long slender down-curved beak for probing into crevices.



#### NEST BOXES

Only a small entrance hole should be provided in a nesting box for tits, or sparrows will commandeer it



Robins and spotted flycatchers prefer a box with only the lower half of the front boarded

Nearly all flesh-eating birds, whether they hunt their prey or seek for carrion, have hooked beaks to help them to tear their food. Hawks, owls, and the larger rapacious gulls have beaks of this kind.

Many birds have beaks adapted to seed eating. These beaks are stout and conical to enable the birds to crush the seeds, but may be quite small as in the linnet, long and sharp-pointed as in the goldfinch which feeds especially on thistles and teasel seeds, or massive nut-crackers, capable of exerting a force of 100 lb., as in the rarest of our British finches—the hawfinch.

But many species such as the starling and blackbird have general-purpose bills, not adapted to one particular method of feeding, and in these birds other features must be studied for clues as to their identity.

#### SIZE, MARKING, SONG, ETC.

It is always important to note the size very carefully, comparing it, if possible, with some familiar species—e.g. “a little smaller than a sparrow and more slender”. Generally speaking, it is fairly easy to settle to which family a bird belongs, and careful observation then enables one to eliminate the various species comprising the family until the final identification is possible. Key features to examine are head, wings and tail. Is there a pale or dark line through or over the eye? Are there white or coloured bars on the wings? Is the tail long, medium or short, square or rounded, uniformly coloured or with pale outer edges? Song or call notes may be helpful, and behaviour is often very important. Does the bird hop or walk? Does it flick its wings, wag its tail, spend its time on the ground or keep to the bushes? Remember that in many species the male may be so much more brightly coloured than the female that at first glance one

could suppose them to be different species. And juveniles may look quite unlike their parents. A young robin, for example, has a freckled brown breast without any trace of red and looks more like a miniature thrush.

## FAMILIES AND SPECIES

### GULLS

Gulls are never garden birds, but some are common inland outside the breeding season and, especially in winter, will land on lawns to feed.

The bird most frequently recorded is the black-headed gull. It is fairly small for a gull (about 15 in.), and slender, with reddish legs and beak and a distinctive white forward edge to the wing. In winter the head is white, with only a small black smudge behind the eyes, which grows larger as winter advances until, by early spring, the whole head is dark brown.

The common gull—which is not so common—is a little larger (16 in.), more thick-set, and has yellowish legs and beak.

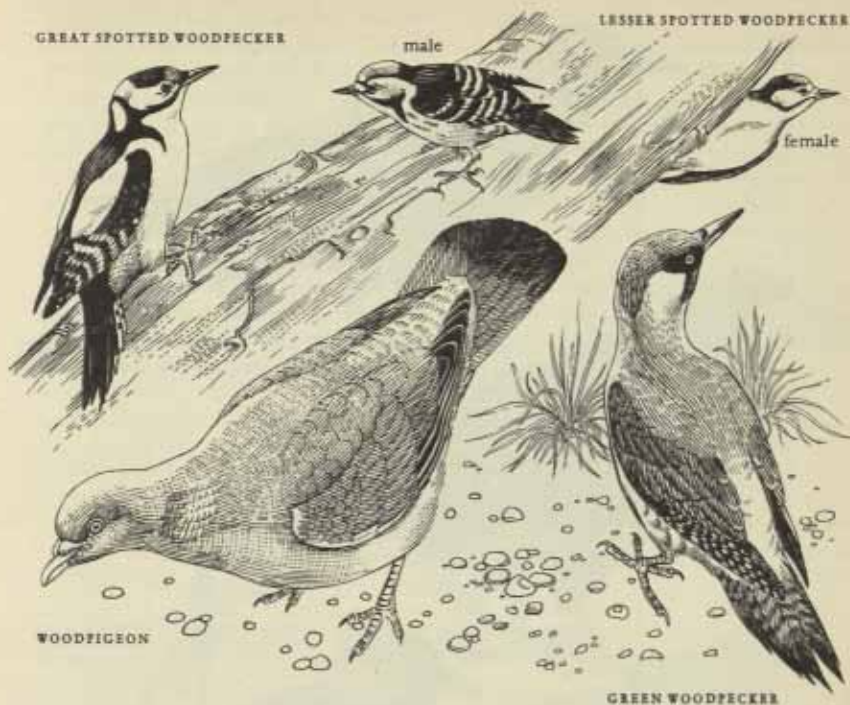
### PIGEONS

The woodpigeon is the common pigeon of the garden and the poulterer's shop. It is a big, plump bird some 16 in. long, with iridescent patches of green and purple on the neck, and beneath these a small white patch on either side. A broad white bar across each wing is very conspicuous in flight. The song sounds as though the bird is saying “take two cows Taffy”.

The stock dove is less common, a little smaller (13 in.), rather darker, and lacks the white on neck and wing.

The beautiful little turtle dove (11 in.) has a fan-shaped tail with white tips to each feather. Its purring song—“the voice of the turtle” mentioned in the Song of Solomon—is one of the characteristic sounds of summer in the woodlands of southern England.





#### WOODPECKERS

Three woodpeckers breed in Britain, the green, the great spotted and the lesser spotted, and all occur in gardens from time to time.

The great spotted woodpecker is the one most commonly seen, sometimes visiting bird tables for food. It is about the size of a starling (9 in.), black and white, with a vivid white patch on the wings and crimson under the tail. The male has a small crimson patch at the back of the head. In juveniles the entire crown is crimson.

The rarer lesser spotted woodpecker is about the size of a sparrow and has no crimson under the tail. The wings are barred black and white, but there is no large patch of white as in the great

spotted woodpecker. The crown of the male is red. In spring these two woodpeckers "drum" by hammering rapidly on resonant dead branches with their beaks. This is a mating call, the equivalent of song, and not a searching for food.

The green woodpecker is over 12 in. long and much larger than the other two. Its back is a dull green, shading almost to yellow on the rump, and the crown is crimson. It is particularly partial to ants and spends much time on the ground searching for them. Its loud laughing call has given it the name of yaffle.

#### SWIFTS, SWALLOWS AND MARTINS

The swift (6½ in.) is the largest of this group. It is very dark brown with a small patch of white beneath the chin. The

CARRION CROW



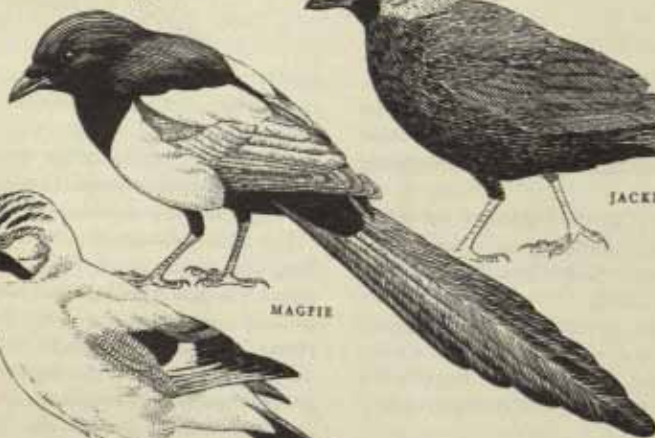
ROOK



JACKDAW



MAGPIE



JAY

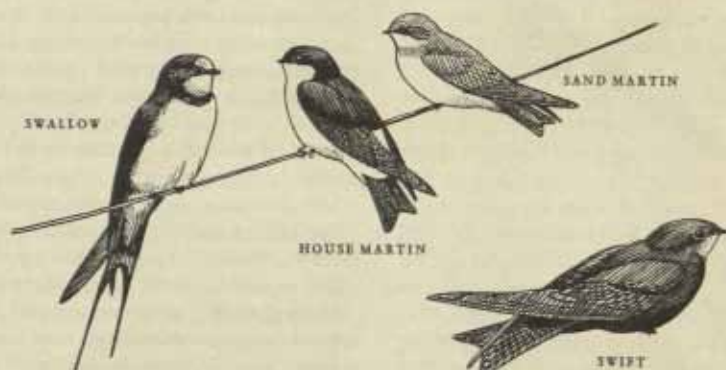


wings are very long and narrow. In summer the birds chase each other high in the sky, screaming shrilly. They do not perch on roofs, telephone wires, etc., and generally swoop straight into the nest hole in the roof.

Although the swallow measures  $7\frac{1}{2}$  in. and is thus longer than the swift, much of this length is accounted for by its long, deeply forked tail and it is noticeably smaller in the body than the swift. It is a glossy, blue-black above with dark reddish throat and has a musical twittering song. It builds a shallow cup-shaped nest

#### CROWS

Five species of the crow family may be seen fairly regularly in gardens. Two of them, the magpie and the jay, are so strikingly coloured that they are unlikely to be mistaken for anything else. Seen from a distance, the magpie appears to be a black bird with a white belly and a vivid patch of white on each wing. It is only on closer view that the beautiful iridescent blue and green in the wings and tail become apparent. The tail is exceedingly long and rounded, giving the bird a total length of 18 in.



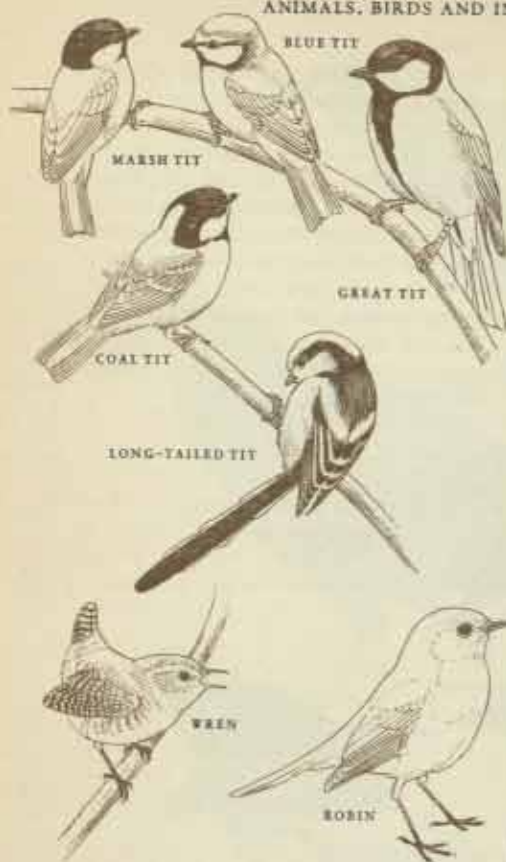
of mud and straw, usually in a building and resting on top of a beam or ledge.

The house martin is 5 in. long, has a forked tail but no long tail "streamers", a white throat, breast and belly, and a very conspicuous band of white across the rump. Its mud nest is cemented to a wall, just beneath the roof, and instead of being a shallow cup like the swallow's, is built right up to the eaves, with only a small entrance. Sand martins measure about  $4\frac{1}{2}$  in. and are appreciably smaller on the wing. They are a medium brown above and white below and lack both the long tail streamers of the swallow and the white rump of the house martin.

The jay measures about 13 in. from beak to tail, but is not so much smaller than the magpie as the measurements would suggest, for its tail is much shorter. It is a beautiful pink bird with a white rump and a bright patch of blue barred with black in each wing. Normally it is very shy, more often heard than seen, but in recent years the jays near London have become bolder and may even be seen searching waste-paper-baskets in the city parks in their quest for food. The note is a loud harsh scold—"skaark".

The jackdaw is common about old houses and churches and frequently nests in chimneys. It is much the same size





and build as the jay but uniformly black save for a greyish patch on the nape. Its pale blue-grey eyes are also a distinctive feature.

The carrion crow and rook are much bigger birds, measuring about 18 in. from beak to tail, and at first it is difficult to distinguish between them. The distinctive features of the rook are a bare greyish-white patch on the face, round the base of the bill and a shaggy appearance to the feathered part of the leg. The feathers on the leg of the carrion crow are much smoother and trimmer, the face lacks the grey bald patch round the bill and, because it is a flesh eater, the bill is a trifle more stout—less dagger-like. Unfortunately young rooks do not have the bald face patch and this can cause some confusion in summer.

After a time it is possible to tell the notes of the two species apart, though the rook has a very varied vocabulary. The call of the carrion crow may be written "kraak"—a harsh, somewhat nasal note repeated several times. The rook's note is generally set down as "caw", but remember that there are many variations. An old gamekeeper once explained the difference by saying that the rook's note was "caw", but the crow says



BLACKBIRDS, male and female

"pork"—because he is fond of a bit of meat—quite a good way of remembering the difference.

#### TITS

Although most people are able to recognize a tit as such there is sometimes confusion in separating the various species. Only two are really common in gardens—the great tit and the blue tit.

The great tit, as its name suggests, is the largest of the tit family. It is  $5\frac{1}{2}$  in. long, and yellow below with a broad, intense black line running down the chest from the throat to between the legs. The head is glossy black with a pale (not white) patch on the nape, the back greenish, shading to a grey blue on the wings.

The blue tit is an inch smaller and is the only tit to have bright blue head, wings and tail.

Slightly smaller than the blue tit is the less common coal tit ( $4\frac{1}{4}$  in.), which is best identified by a large squarish white patch on the back of its head.

Two other less common tits, looking like the coal tit, but lacking the white patch, are the marsh and willow tits. These are much more difficult to tell apart, the best distinguishing feature being perhaps the note. The marsh tit's note may be written "pichou", and the

nasal note of the willow tit "chaay".

There is also the long-tailed tit—a dainty little ball of pink, black and white, with a very long tail accounting for 3 in. of its total length of  $5\frac{1}{2}$  in.

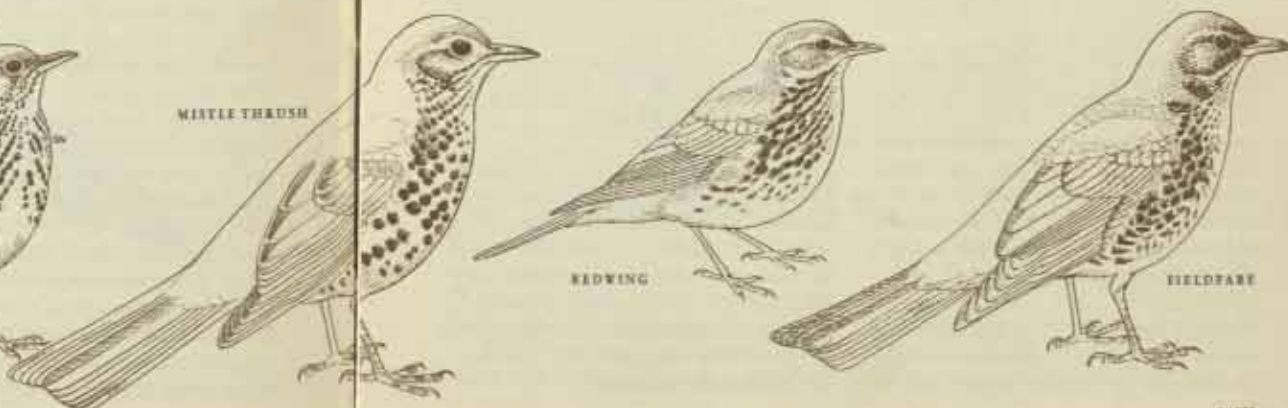
#### WREN

This tiny brown bird which measures only  $3\frac{1}{4}$  in. is a distinct personality in the garden. His short tail is permanently cocked up behind him and his trilling song is so loud one can scarcely believe it comes from so small a body. The cock builds several domed nests each spring, often in ivy, but only one of them is taken over and lined by the female.

#### THRUSHES

This group includes the song thrush and the mistle thrush, the blackbird, two beautiful winter visitors—the redwing and fieldfare—and the related but much smaller robin. Their main food is insects, but they also eat fruit of various kinds. Their bills are slender but fairly strong. Their gait is normally a hop but they do occasionally run. They are among our most beautiful songsters.

The blackbird is the commonest of the group and is about 10 in. long. The cock is unmistakable, being black all over with an orange beak and a ring of orange skin round his eye. The hen is brown all over,



REDWING

FIELDFARE

the brown of the breast being mottled and often having a slight reddish tinge. Her bill is normally brown but may show traces of dull orange. The young are a warmer brown than the female and freckled on the breast, so that they can sometimes be mistaken for thrushes.

The song thrush is an inch smaller than the blackbird and more slightly built. It has uniform brown upper parts and is creamy-buff below, marked with small spots or dashes. Its song may be told from that of the blackbird by being less varied, with phrases repeated two to four times.

The mistle thrush (10½ in.) is bigger than both the song thrush and the blackbird. Its back is a greyer brown than that of the song thrush and the underparts are more boldly marked with big, rounded spots. The juveniles are paler and mottled above. The mistle thrush is aggressive, often driving other species from the bird table. The fieldfare, one of the winter visitors (10 in.), has slate grey head and rump, and a chestnut back; the breast is suffused with a warm rusty-brown.

The other winter visitor, the redwing (8½ in.), is like a small song thrush, but with a pronounced creamy-white stripe over the eyes and, on the sides, a rich chestnut-red which is frequently almost hidden by the folded wings.

The adult robin (5½ in.) is light brown above, with bright orange forehead, throat and breast bordered with pale grey; it is important to remember that the young are speckled like small thrushes. Their breasts start to become red when they are two to three months old and for a while they are strange, parti-coloured little creatures.

#### WARBLERS

Warblers are a difficult group requiring care in distinguishing one member from another. In all but the larger gardens

they are likely to be migrants, pausing for a day or two on their journey. Without song, identification may prove difficult. They are dainty, active little birds with very slender beaks and prefer fairly thick cover. As they pass through in the autumn they may be found searching for aphids among the rows of peas. The three most likely to turn up are the willow warbler, the chiffchaff and the whitethroat.

The willow warbler (4½ in.) has an olive-brown back with creamy-yellow underparts and is slightly yellower than the chiffchaff, although in autumn this character is not reliable. It has light brown legs but the song is the most helpful feature to note. The willow warbler has a silvery little descending song ending with a flourish.

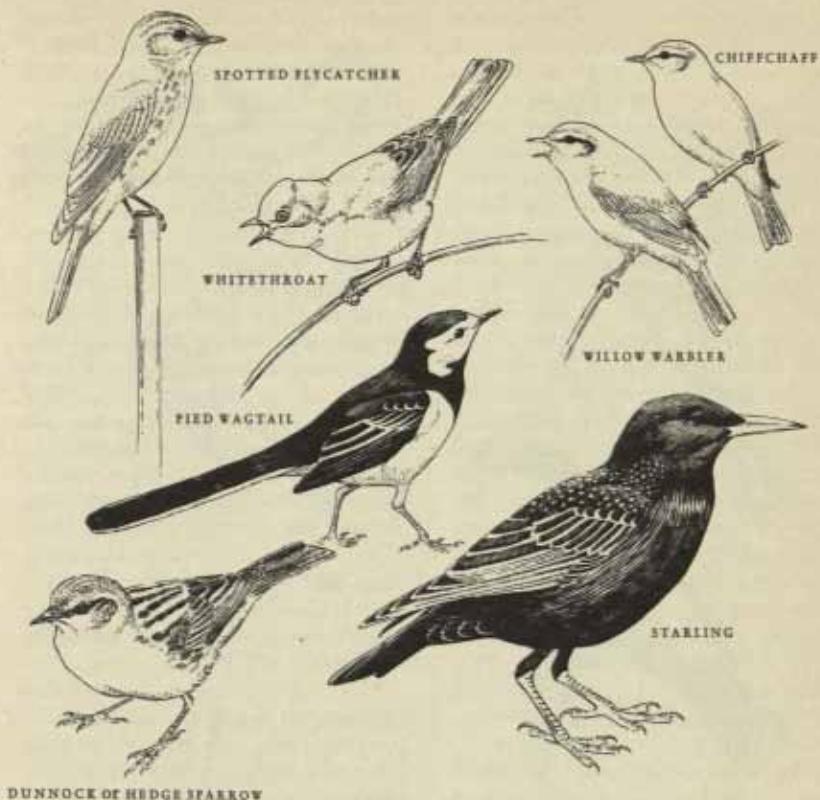
The chiffchaff (4½ in.), also with an olive-brown back and creamy-yellow underparts, usually has dark brown legs, but this distinction is not always reliable. It sings its own name—a varied pattern of “chiffs” and “chaffs” . . . “chiff chiff chaff chiff chaff” etc.

The whitethroat is appreciably bigger than the willow warbler and chiffchaff. It has a pure white throat and is sandy coloured on the wings. The male has a grey head; in the female and young male the head is the same shade of brown as the back. The whitethroat's note is a scolding “charr” which it delivers while well concealed in the vegetation. Its song is hurried and scratchy.

#### SPOTTED FLYCATCHER

This summer visitor is quite a common garden bird, even occupying large town gardens. It has a mousy brown back and white breast faintly streaked with brown. Its most noticeable characteristics, however, are the very upright position in which it sits and its habit of swooping out to catch flies, returning to the same perch a number of times.





#### DUNNOCK OR HEDGE SPARROW

This is a quiet, unobtrusive little brown bird ( $5\frac{1}{2}$  in.), rather sparrow-like but with a slender, sharp-pointed bill, a grey breast and the habit of frequently flicking its wings. It spends much of its time on the ground and may be reluctant to visit the bird table. Its song is a hurried jingly warble rather similar to the wren's but not so loud.

#### WAGTAILS

Three species of wagtail breed in the British Isles but only the pied wagtail (7 in.) is in any way a garden bird. It is a black and white bird, with a very long

tail which is for ever dipping up and down as it runs in search of food. The winter plumage is drabber. The young ones have grey backs and are much less boldly marked, their appearance being rather smutty.

#### STARLING

From a distance the starling ( $8\frac{1}{2}$  in.) appears to be black, but a closer view reveals iridescent purples and greens in the adult birds, while in early winter the whole plumage is heavily flecked with a golden-brown. The bill is yellow in the breeding season, blackish at other times of the year. The yellow may start to





CHAFFINCH



GOLDFINCH



LINNET



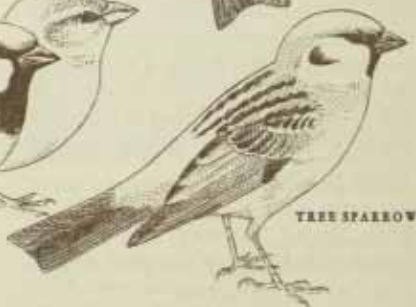
BULLFINCH



GREENFINCH



HOUSE SPARROWS  
male and female



TREE SPARROW

appear as early as December; by July or August it will have disappeared again. Juveniles, which are usually very noisy, are a mousy brown, but they start moulting out of this plumage when only about two months old, darker feathers with pale tips slowly replacing the brown. The head is the last part to moult. Starlings in partial moult may be difficult to identify, but they have short tails and they always walk instead of hopping. The starling is a great mimic and its cheerful, wheezy song may include snatches of the songs of other birds.

#### FINCHES AND SPARROWS

With the exception of the goldfinch and the tree sparrow, the females in this group are plainer than the males. They all have short, stout, rather conical bills although there is a good deal of variation from one species to another.

The male greenfinch (5½ in.) has a dull green back with rather yellowish underparts, and bright yellow in the wings and at the base of the tail. The beak is horn coloured.

The chaffinch (6 in.) is rather longer but less thick-set than the greenfinch. The cock is a strikingly handsome bird in the breeding season, with a blue-grey head, a rosy-pink breast, a chestnut back and a greenish rump. Two bold white bars in the wing help to distinguish both the male and the female. Its song has been rendered as "*chip chip chip tell tell tell cherry erry erry tissi chewee*", and no words could get nearer to it than this.

The bullfinch (5½ in.) is bulky, like the greenfinch. The cock has a bright rosy breast (brighter than the chaffinch's), black head, wings and tail, a grey back and a conspicuous white rump. The beak

is short, black and enormously stout. It is a shy, retiring bird and often reveals its presence only by a soft clear call note which might be rendered as "*peeu*".

The linnet (5¼ in.) is easiest to recognize in summer when the red forehead and breast of the male are unobscured by brown tips. The head is greyish, the back a chestnut-brown, and the forked tail and wings are fringed with white. The female never develops the red, and both the female and the juvenile have rather streaky breasts. The twittering song is agreeable and varied, and in the past linnets were very popular as cage birds.

The goldfinch (4½ in.) has also a long history as a cage bird, both on account of its handsome appearance and its cheerful, liquid twitter. The face is scarlet with dull white cheeks and the top of the head black; the wings are black and vivid yellow, the rump white. It is impossible to confuse the goldfinch with any other species. It frequently nests in apple, pear and horse chestnut trees, usually in the top fork, and is not uncommon in gardens in southern England.

The house sparrow (5½ in. long). The male has dark brown upper parts, streaked with buff, a dark grey crown which is brown at the sides, white cheeks and underparts, and a black bib which is much reduced in winter. The female and juvenile are a paler brown, and lack both the bib and the grey on the crown.

The tree sparrow (5½ in.) is a smaller, neater, much less evenly distributed relative of the house sparrow. It resembles a cock house sparrow, but the entire crown is chocolate-brown and there is a small black patch on the whitish cheeks. The sexes are alike.

## INSECTS

The host of creeping, crawling, burrowing, swimming and flying creatures known loosely as insects are so numerous and varied that zoologists divide them, on the basis of relationships, into smaller units to narrow their field and facilitate identification. Nearly all the small creatures to be found in a garden belong to one of three great groups:

*Annelida* (or ringed worms), which include earthworms, and many of the marine worms.

*Mollusca* (or "soft-bodied ones"), which include slugs and snails, as well as cockles, oysters, winkles and other shellfish.

*Arthropoda* (the "jointed-leg" creatures), the group to which most of the small garden creatures belong. This group is so vast that it has been divided and subdivided in order to get it down to really manageable units. It is divided into four main classes: 1. the *Crustacea*, which include crabs, shrimps, lobsters and the hump-backed little woodlice and slaters found in gardens; 2. the *Arachnida*, which include spiders, harvestmen and mites, all having four pairs of legs; 3. the *Myriapoda*, or "many-legged" creatures, which include the centipedes (literally "hundred-footed ones"), millipedes, etc., and 4. the *Insecta*, or true insects.

## ANNELIDA

## WORMS

Earthworms are familiar to most people. They feed on vegetable matter, and draw considerable quantities of grass and leaves below ground. They also break up and aerate the soil by their movements. They are thus very beneficial in gardens, although their casts can be a nuisance on a lawn.

Moisture is essential to them so that

in dry weather they burrow deeper. In water-logged ground, however, there is a danger of their drowning. Worms are hermaphrodites, that is, each individual is both male and female.

## MOLLUSCA

## SLUGS AND SNAILS

These feed on vegetation. They prefer damp places—old walls, rotting logs, deep grass—and avoid the heat of the day as much as possible. Because of their protective shells (which are a familiar sight) some species of snail are able to withstand long periods of drought. Many wild plants have developed protective devices, such as hairy leaves and stems, against slugs and snails, but unfortunately most garden plants, particularly the more succulent vegetables, have no such protection and are frequently devastated.

## ARTHROPODA

## CRUSTACEA

## WOODLICE AND SLATERS

Both are about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and look alike, but an easy way of telling them apart is that the woodlice curl into a ball when touched and the slaters do not. They are grey or brownish creatures with oval, armour-plated bodies. They are frequently found in decaying wood, especially under the bark, and also under stones. They eat stems, leaves and roots of certain plants and can be a pest in frames and greenhouses.

## ARACHNIDA

## SPIDERS AND HARVESTMEN

Both have eight legs but there the similarity ends, for in the harvestmen the head, thorax and abdomen are united in a single, undivided body, but in spiders they are separate, with a distinctive



narrow waist between the thorax and abdomen.

Spiders feed on flies and other small insects. Many spin webs to catch their prey, the web of the common cross or garden spider being particularly beautiful. Others stalk their prey. Some live in burrows, and one species even lives under water, breathing from a bubble of air trapped in a domed web.

Harvestmen are omnivorous, and have claws for tearing food. They hide by day, and lay their eggs underground.

#### MYRIAPODA CENTIPEDES

These are usually brownish in colour, with flattened bodies, long antennae and only one pair of legs to each segment of the body (of which there may be as many as 175). They live in dark, damp places, under stones, in walls, decaying vegetation, etc., and are generally beneficial to gardeners as they live on insect larvae, slugs and snails, though they also eat small worms and smaller centipedes.

Most species of millipedes have tubular bodies and are distinguished from centipedes by having *two* pairs of legs to each segment of the body. They live in the kind of places centipedes occupy, but as they are vegetarians they can do considerable harm by damaging roots, boring into stems and even into fruit.



SLUG



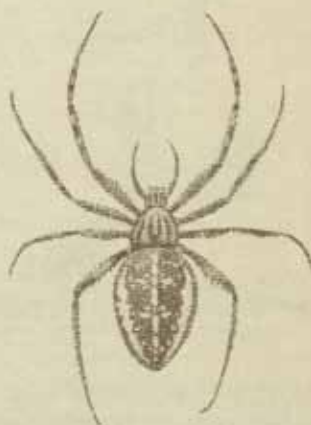
SNAIL



WOODLOUSE



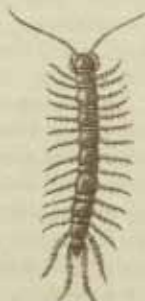
SLATER



GARDEN SPIDER



MILLIPEDE



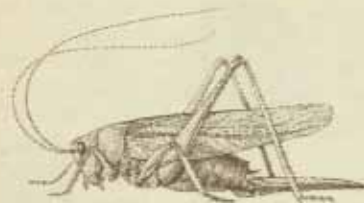
CENTIPEDE



HARVESTMAN



SHORT-HORNED GRASSHOPPER



GREAT GREEN GRASSHOPPER, female



EARWIG



DAMSEL-FLY

## INSECTA

A true insect in the adult stage has a body divided into three parts, head, thorax or chest, and abdomen. It has three pairs of legs attached to the thorax, one pair of antennae or feelers, and usually wings, though these may be tucked out of sight beneath hard wing cases, as in the case of the ladybird and other beetles.

Some million different species of insects (in the zoologist's sense of the word) have been discovered all over the world and named. There are 20,000 in the British

Isles alone, and they are divided into 22 still smaller categories, called "orders", which may be quite small, or bewilderingly large.

There are, for example, only five British species of earwig (order *dermaptera*) but over 6,000 British species of *Hymenoptera*—the order to which bees, wasps and ants belong. And even within the species themselves a creature may exist in four or five different forms at different stages of its life: eggs, larva or caterpillar, pupa or chrysalis, and adult—in which final stage the male and the female may be so dissimilar as to seem quite unrelated.

The following insects are more frequently noticeable in the garden.

## GRASSHOPPERS

These are divided into two groups, short-horns and long-horns, depending on the length of the antennae.

The short-horns are the common grasshoppers of the British Isles. They live chiefly in long grass and are vegetarians. Their chirping song, known as stridulation, is made by rubbing the hind leg against the wing.

There are 14 species, and these vary in colour, though basically they are shades of green and light brown. As their colouring is disruptive they are able to merge into their background. They measure up to  $1\frac{1}{4}$  in., though the size varies with the species.

Long-horn grasshoppers are found chiefly south of the Thames. Largely arboreal, they are omnivorous, eating young buds as well as many insects, including other grasshoppers. They stridulate by rubbing their forewings together. The great green grasshopper is the largest species. The females are up to  $2\frac{1}{2}$  in. long, and the males are a little shorter.

British grasshoppers do little harm and need not be feared in the garden.

## EARWIGS

Contrary to popular belief, it is probable that earwigs do little harm and even a certain amount of good. They are omnivorous—eating insect larvae as well as decaying vegetation—but are mainly nocturnal in their feeding and prefer to spend the day in some crevice or hole. Flowers often provide them with this shelter, as do the hollow stems of such plants as lupins and delphiniums. When fully grown, the common earwigs are about  $\frac{1}{2}$  in. long, with glossy reddish-brown head and pincers, a darker brown abdomen and light brown legs.

## DRAGON-FLIES AND DAMSEL-FLIES

Dragon-flies, of which there are 43 species in Britain, are large, swift-flying carnivorous insects which pursue their prey on the wing. The length of their bodies is between  $1\frac{1}{2}$  and 3 in. Damsel-flies are smaller, with a weaker, more fluttering flight. Both are most brightly coloured, being brilliant red, turquoise, green, yellow, black, etc.

The larvae of both live under water and in the adult stage it is normally only the powerful dragon-flies that venture far from the water.

The beautiful colours of both dragon-flies and damsel-flies add to the charm of a garden pool. They both have strong jaws for eating their victims, but neither of them sting.

## APHIDS

All kinds are alarmingly prolific. See also *Garden Pests*. It has been calculated that, but for the host of insects and birds which prey on them, the progeny of a single greenfly would destroy their food plant throughout the world in the course of two or three years.

The life cycle of greenflies is remarkable. During the summer there are only females, and these produce other females by parthenogenesis or virgin birth. Some of these offspring are wingless and remain



DRAGON-FLY



LACE-WING FLY



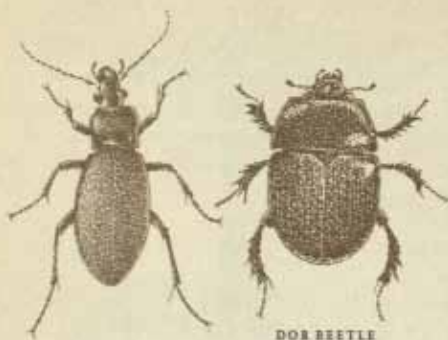
DEVIL'S COACH-HORSE BEETLE

on the plant on which they were born; others are fully winged and fly off to establish new colonies. Males are born in late autumn, when mating takes place. The species survives the winter only in the egg stage.

## LACE-WING FLIES

These are about  $\frac{1}{2}$  in. long and are fragile creatures with delicate transparent wings. The green lace-wing, with pale green wings and body and large bronze eyes, should be examined through a magnifying-glass for its full beauty to be seen.





VIOLET GROUND BEETLE

DOR BEETLE



COCKCHAFFER BEETLE



ASPARAGUS BEETLE



COLORADO BEETLE

It is quite common in gardens, where it consumes large quantities of aphids.

#### BEETLES

There are 3,690 species of British beetle. Their forewings have become hard (usually horny) sheaths, which meet in a straight line down the back and are lifted in flight, though not all beetles are capable of flight. The softer hind wings are folded beneath the sheaths. Their mouth parts are robust for biting and chewing.

The devil's coach-horse or cock-tail beetle frequents rank vegetation and

middens, preying largely on insects. It carries its tail turned up, like a scorpion, and appears to be dangerous but is actually harmless and even beneficial in the garden.

The violet ground beetle, about 1 in. long, is a very common garden beetle. It is black with a purplish sheen. It has a long oval body and long legs, and is a swift-runner, although it spends most of the day hiding under vegetation or in the soil, and generally runs across the path only when disturbed by gardening operations. It is carnivorous and destroys the harmful larvae of various moths.

The dor beetle, up to 1 in. long, is one of the heavy-weights of the British beetle world. It is black with iridescent purple and blue beneath. It lives on dung which it rolls into a ball and buries at anything up to a foot below the ground. It buries far more than it requires, and so has a beneficial effect in putting the manure where it can do most good. It flies by night, especially in late summer evenings, and if it falls on its back after colliding with something it has the greatest difficulty in righting itself.

The cockchafer beetle, up to about 1 in. long, is a brownish colour and flies chiefly at dusk. It is distinctly harmful to the farmer and gardener as it feeds on the leaves of trees, especially oak and chestnut. The larvae remain below ground for as long as four years, feeding on roots of grasses and damaging the roots of young trees.

Leaf beetles are a group of small and generally brightly coloured beetles whose larvae may do great harm. Species of particular menace to the gardener are the colorado beetle, which is ladybird-shaped and yellowish-orange with black longitudinal stripes on the wing cases, and the asparagus beetle, which is longer

and narrower and greenish-black with six orange spots on the wing cases.

Ladybirds, of which there are about 50 species, are often named after the number of spots they have on their backs. They are chiefly red with black spots, though the twenty-two-spot is yellow. The two-spot and the seven-spot are among the most common. Their larvae do an immense amount of good, living principally on aphids.

Wireworms, the larvae of click beetles, do a great deal of harm to crops, but birds, particularly starlings and rooks, destroy countless thousands of them. For their full description, see *Garden Pests*.

#### ANTS, BEES, WASPS AND ICHNEUMON FLIES

These are of the order Hymenoptera (Membrane-wing). There are over 6,100 species in this order, some of them having great economic importance.

There are 36 species of ant in the British Isles, several of which occur in gardens. British ants are all vegetarians, taking nectar, seed juice, fruit and, in particular, the sweet exudation from greenfly known as honeydew. Ants are colonial, and big nests, especially those in secure positions such as under concrete footpaths, may last almost indefinitely. There are records of ant colonies 80 years old. They cause little trouble except when they swarm, usually during sultry weather in late summer, or when they enter the house.

Bees, of which there are 240 species of varying sizes in Britain, are divided into the social, which includes the hive bee and the bumble bee, and the solitary, which are the majority. They all depend on flowering plants for nectar and pollen. Social bees care for their young and these, in turn, care for the next generation in the colony.



WIREWORM



LADYBIRD



RED ANT



COMMON BLACK ANT



BUMBLE BEE

Female solitary bees leave a supply of food in each cell, lay an egg on top and seal it up.

Most species of bumble bee (there are 25 species in Britain all about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long) live below ground, colonies usually being very small and rarely exceeding 300 to 400. The queen alone survives the winter to found a new colony. The bumble bee is generally amber and black. Some species known as cuckoo bees are semi-parasitic, laying their eggs in the nest of other bumble bees and thus avoiding the task of raising their young.



HIVE BEE



LEAF-CUTTER BEE



COMMON WASP



MINING BEE



BLUEBOTTLE



CRANE FLY

There are about 28 species of leaf-cutter bee in Britain. The colours vary with the species, though many are amber and black. The size also varies, some are  $\frac{1}{2}$  in. long, others smaller. They cut oval-shaped pieces out of tender green leaves, often rose leaves, and roll them between their legs to carry them away to use in nest construction.

In Britain there are approximately 100 species of mining bee, most of them being under  $\frac{1}{2}$  in. long—and of variable colour. They are solitary bees, looking not unlike hive bees, and lay their eggs singly in deep holes, often excavated in lawns. The spoil from the burrow is carefully spread round to avoid attracting attention to the opening. They help to pollenize and do no harm.

More than 280 species of wasp can be found in Britain. The common wasp is yellow and black, and  $\frac{1}{2}$  in. long. Like bees, they feed upon nectar, fruit juices and other vegetable matter, but feed their larvae on insects, spiders and other animal matter, thus acting as scavengers. Only the queen survives the winter to found a new colony.

Gall wasps are tiny little creatures, all under  $\frac{1}{2}$  in. long. They are rarely seen, but their presence is recognized by the galls produced by their larvae, such as oak apples and robin's pin-cushions.

Ichneumon flies vary considerably in form—there are 2,000 species in Britain. Their sizes are various, the largest being about 2 $\frac{1}{2}$  in. long including its ovipositor. They are parasitic and lay their eggs in the nest or larvae of other insects, for example caterpillars, and are thus responsible for destroying vast quantities of insects, many of which are injurious to man.

FLIES, MOSQUITOES, ETC.

This is a very big order, there being over 5,200 species in the British Isles.



There are nearly 300 species of crane fly in Britain. The larvae of this species are the leather-jackets, notorious to both farmer and gardener for the damage they do to the roots of grasses. The one most generally seen is the daddy long-legs, which is brownish and, including the unstretched legs, about  $1\frac{1}{2}$  in. long.

Flesh flies, of which there are about 330 species, include the brilliant bluebottles and greenbottles. Their names are descriptive of their colours, and they range from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. They live on all forms of decaying matter, particularly carrion, and are spreaders of disease. Some of them are parasitic in the larval stage.

Hover flies take their name from their habit of hovering motionless in the air, their wings almost invisible. There are about 230 species in Britain, most of them brightly coloured. Many of them resemble bees or wasps. They take nectar from flowers, and in the larval stage many of them live on aphids.

Mosquitoes, of which there are 49 species in Britain, are brownish and require stagnant water to breed in. Their larvae are frequently to be found in the garden water-butt.

Clegs, which are one of the 28 species of the horse fly, do no harm in gardens but, like mosquitoes, attack the gardener. They are blood-suckers and the wounds they make can cause much irritation. They are about  $\frac{1}{2}$  in. long and are dark grey or black.

#### BUTTERFLIES AND MOTHS

The best way to distinguish between butterflies and moths is to examine their antennae. In butterflies the antennae swell out at the tips to form minute clubs; in moths they are very varied and often feathery. Butterflies normally rest with their wings folded vertically above their backs; many moths fold their



GREENBOTTLE



CLEG



HOVER FLY



MOSQUITO

wings backward so that the forewing covers the hind wing.

There are more than 60 species of butterfly to be found in Britain. Between March and November one kind or another is on the wing, providing movement and colour in the garden and pollinating plants in the same way as the bees. But the caterpillars of some of them are harmful and should be destroyed (see *Garden Pests*).

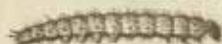
The male wall (*Parage megoera*) is brownish-orange with dark brown markings. It has a black and white spot on each forewing and four similar spots on each hind



WALL BUTTERFLY



MEADOW BROWN BUTTERFLY



RED ADMIRAL BUTTERFLY



wing. The colour of the female is more variable and it has larger wings with clear transverse lines. The wall is on the wing from May to August. The caterpillar feeds on grasses, especially couch and cock's foot, and is pale green dotted with white, with three pale lines edged with dark green on its back and a white line on each side. The head is green, dotted with white.

The colour of the male meadow brown butterfly (*Epinephele jurtina*) is warm brown with dull orange markings. It has a black and white spot within a patch of orange near the tips of the wings. The colour of the female is very variable; it has no black and is more marked with orange which forms a broad patch on the forewings. The butterfly is on the wing from June to September. The caterpillar feeds on grasses and is bright green, covered with short hairs and with a darker green line down the back. The head is a darker green than the body.

Both male and female red admiral (*Pyrameis atalanta*) are a warm brown with scarlet bands and white dots on the forewings and black dots on scarlet bands on the hind wings. The white edges of the wings are dotted with black and there is a tracing of blue on the margins of the forewings and a little blue at the angle of the hind wings. They are on the wing from May to October or November. The caterpillars feed on nettles and are variable in colour. Some are almost black, freckled with white, others are grey marked with yellowish green. Some have two yellow stripes on the sides. The head is black.

The small tortoiseshell (*Aglais urticae*) is reddish-orange, with yellow patches, black markings of varying size, and blue crescents. It is on the wing from June to September. The caterpillar feeds on nettles, and is yellowish freckled with

black, with a black line bordered by yellow down the centre of the back. The head is black, speckled with yellow.

The peacock (*Vanessa io*) acquired its name because of the "peacock's eyes" on the brownish-red wings. The hind wings also have "eyes" and are a much darker brown, faintly marked with yellow near the base. The peacock is on the wing from March or April to August. The caterpillar feeds on nettles and is velvety black with white spots. The head is glossy black.

The male common blue (*Polyommatus icarus*) is blue, tinged with violet, with black edges to the wings. The female is generally brown and has blue-scaled wings edged with a line of orange crescents and black spots. This butterfly is on the wing from April to September. The caterpillar feeds on bird's-foot trefoil and rest-harrow, and is green and wrinkly, covered with brownish hairs and with a darker line down the centre of the back. The head is black.

The large white butterfly (*Pieris brassicae*) is white with broad black tips to the forewings and a black mark on the front edge of the hind wings. The female also has two black marks on the forewings. The large white is on the wing usually from May to September. The caterpillar feeds on all brassicas and is greenish with yellow lines on the back and sides, speckled with small, blackish warts, and smells unpleasantly.

The small white butterfly (*Pieris rapae*) is white, but at times somewhat yellowish, and generally has a slight clouding of black on the tips of the forewings and black spots near the centre of the wings; the markings are rather faint in the male. The butterfly is on the wing from May to September, occasionally longer. The caterpillar feeds on plants of the cabbage family as well as on nasturtiums and



SMALL TORTOISESHELL BUTTERFLY



PEACOCK BUTTERFLY



COMMON BLUE BUTTERFLY







ORANGE TIP BUTTERFLY



BRIMSTONE BUTTERFLY



LACKEY MOTH



mignonette. It is green with a yellow line on the back and a row of yellow dots on the sides, speckled with black and covered with short black hairs. The head is brown.

The white or creamy-white butterfly, orange tip (*Euchloe cardamines*) has hind wings mottled with greenish-grey. The male has a black spot on a large orange patch on the forewing, the tip of which is black. This orange colour is replaced in the female by a smaller patch of dark grey. The butterfly is on the wing from mid-April to August, chiefly in June. The caterpillar feeds particularly on hedge-mustard and cuckoo-flower, and is a dull green, bluer above and yellow below, covered with fine white and black hairs, and with a white line along the sides.

The tips of the forewings on the brimstone (*Gonepteryx rhamni*) are pointed. The male is sulphur-yellow with an orange spot at the centre of each wing and small rust-red dots along the front and outer margins of the forewings. The female has similar markings but is a greenish-yellow colour. The butterfly is on the wing from March (sometimes February) to August. The caterpillar feeds on the buckthorn and is green becoming bluer on the flanks, with a pale line along the sides, the whole speckled finely with black.

#### MOTHS

Although moths vastly outnumber butterflies, they are chiefly active at dusk and so are seldom noticed. They are attracted to bright lights and can also be collected on tree trunks that have been smeared with sugar solution. The larvae of some moths do great damage to plants and trees.

The following are four of the most commonly found larger moths.

The male lackey (*Malacosoma neustria*) varies from pale yellow to pale reddish or dark-brown, and the female from pale to reddish-brown. They are on the wing during July and August. The caterpillar feeds on fruit trees as well as on hawthorn, birch, elm, oak and willow. It is blue-grey and hairy with a thin white line down the middle of the back flanked by reddish stripes.

The forewings of the garden tiger (*Arctia caja*) are whitish, barred with brown, the hind wings vary in colour from bright scarlet to orange and even yellow, heavily spotted with blue-black. This moth is on the wing in July and sometimes in August. The caterpillar feeds on a very wide variety of plants and is almost black, being densely covered with long black hairs on the back and reddish hairs on the sides.

The common yellow underwing (*Noctua pronuba*) has forewings which range in colour from sandy and reddish-browns to dark purplish-brown, and yellow hind wings bordered with black. It is on the wing chiefly in June and July, but has been seen earlier. It is frequently disturbed during the day. The caterpillar feeds on grasses and low plants and is a brownish colour, sometimes yellowish or tinged with green, and has dull yellow lines on the back. The head is pale brown with darker marks.

The magpie (*Abraxus grossulariata*) is white or yellowish with orange bands and black spots and dashes on the forewings. The hind wings are less heavily spotted with black and have no orange. The magpie moth is on the wing in July and August. The caterpillar feeds on currants, gooseberries, apples, hawthorn, privet and elm, and is generally a creamy white with black patches and dots and a red line on the sides. It is sometimes completely black. The head is black.



GARDEN TIGER MOTH



COMMON YELLOW UNDERWING MOTH



MAGPIE MOTH



## Notes on Garden Law

WHEN legal advice is needed about matters concerning the garden, a solicitor should be consulted. The following notes can serve only as a guide to some of the legal problems relating to the garden.

### ANIMALS

The owner of a domestic animal is not, in the absence of negligence, liable for any vicious, mischievous act done by the animal, unless the vice or ferocity is contrary to the normal character of the species to which the animal belongs, and the owner is proved to have known of the animal's tendency to do the kind of damage done. If the owner is, however, negligent, absence of knowledge is immaterial. But if a dog worries almost any farmyard animal, its owner becomes liable without any proof of knowledge or of neglect on his part or of any mischievous propensity in the animal.

The owner of domestic animals is bound to keep them upon his land under control, and if they escape on to a neighbour's land and commit a trespass he is liable for such of the damage done as it is in their nature to do. It is to be expected, for example, that when cattle, sheep or poultry stray into a neighbour's garden they will eat his grass and vegetable produce, and their owner will therefore be liable.

This liability is absolute, unless the escape was involuntary or due to an act

of God or to the act of a stranger (not known to the owner) or unless it was caused by the default of the injured party (in failing to maintain his fence, for example). But no action lies for the trespass of cats or dogs (except as to farmyard animals) or for any damage that they do, unless the action can be brought for negligence. It is not negligence to allow liberty to an animal of a kind which is usually given liberty.

The owner of a domestic animal which enters a garden from a highway is not, if there has been no negligence, liable for damage caused by it, and the garden owner should protect his property by fencing it. Any person bringing animals on to the highway is, however, bound to take reasonable care that they do no damage to the person or property of others, and if such a person is negligent the garden owner may be able to recover damages. He must, however, prove negligence, but the unexplained presence of the animal is some evidence of negligence.

A landowner is under no duty to prevent domestic animals escaping from his land on to the highway. If, therefore, such animals do escape, and cause damage, he is under no liability unless it can be shown that he knew of the animal's mischievous or vicious propensities.

There is no right to enter a neighbour's land to dig up rabbit burrows. There are, however, under the Pests Act, 1954,



special Statutory Orders made for the reduction of the number of rabbits and a gardener who is plagued by rabbits could profitably ask if the Ministry of Agriculture, Fisheries and Food, Hook Rise, Tolworth, Surrey, could help him.

Local authorities enforce statutes dealing with rats and mice.

### BIRDS

Provisions of the Protection of Birds Act, 1954, make it a criminal offence punishable by a fine of up to £5 to kill, injure or take any wild bird, or to take, damage or destroy the nest of any wild bird.

The Act, however, is much more complicated than this and there are four schedules which contain lists of birds. The Home Secretary has power to vary the names of the birds inserted in these schedules so that the birds which are protected at one time may later cease to be protected. The considerations which influence the Home Secretary are the rarity of the bird, or its value for horticulture or agriculture.

If, therefore, a gardener feels that he must kill some bird, he should pause if he is not sure what bird it is. On the other hand, if he is prosecuted for killing or injuring a wild bird (other than a bird protected at all times or during the close season by special penalties) he has a good defence if he satisfies the court that his action was necessary for the purpose of preventing serious damage to crops, or any other form of property.

Further information about the Act and wild birds can be obtained from the Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire.

### BONFIRES

If a garden owner uses his garden in such a way as to interfere with the health, comfort or convenience of a neighbour, he may become liable under the law

concerning nuisance, but the interference has to be substantial before the law will take notice of it. Thus the noise of a mowing machine or the smoke from a bonfire, although they may be objected to, are generally speaking incidental to the use of a garden and no legal complaint can be made about them.

Only if a man's conduct passes the bounds of what is reasonable can a cause of action arise.

The smoke from an occasional bonfire is unlikely to attract the operation of the Clean Air Act, 1956, since such smoke is not forbidden in smoke control areas and would probably not be a nuisance to the inhabitants of the neighbourhood, unless perhaps the fire had been lit with paraffin and gave off black smoke, when a local authority could bring a gardener before a magistrates' court. And a bonfire should not be lit if the smoke from it is going to spread across a public road and thereby endanger road-users; the person who lit this bonfire might well be liable if an accident resulted.

### DAMAGE BY BRANCHES AND ROOTS

An action for damages can be brought if the roots or branches of a tree encroach on another person's property and cause actual damage to it.

In certain cases a landlord may be liable for damage, although he has never been in actual occupation of the property. A tenancy agreement may contain a clause whereby the tenant agrees to keep trees and shrubs in proper condition and to indemnify the landlord against any claims.

It is wise to see that comprehensive insurance policies cover any damage caused by tree roots and branches.

The passage of time does not give a landlord a legal right, comparable to a right to light, to have his tree roots or

branches growing in or over his neighbour's land.

### DAMAGE FROM SPRAYING

The dangers of spraying, whether in the form of liquid or dust, are now more widely appreciated and the legal consequences should be known. If a neighbour's crop or land is injured in any way by spray from adjoining land, he can sue for damages and, if the spraying continues, he can apply for an injunction to stop it.

### DAMAGE TO GARDENS

The Town Gardens Protection Act, 1863, despite its name, does not protect ordinary gardens, but only enclosed gardens and ornamental grounds set apart for public purposes.

A large number of criminal offences are, however, of importance to gardeners. It is an offence to steal, or destroy or damage with intent to steal, any plant, root, fruit or vegetables, growing in any garden or greenhouse, or any tree, sapling, shrub or underwood growing anywhere.

Sometimes no intent to steal can be proved, and then (subject to proof of unlawful intent) it is the doing of damage alone which attracts punishment. Broadly speaking, it is an offence to destroy, or damage with intent to destroy, any of the trees and plants mentioned above, or to destroy any fence, wall, stile or gate. An Act of 1914 further makes it an offence wilfully or maliciously to commit any damage to any property whatsoever; for example, trampling on grass.

The maximum penalties for these offences vary widely, depending sometimes on the value of the property involved and sometimes on whether or not it is the first or subsequent conviction, but in most cases fines and imprisonment can be ordered.

## FENCES

### CHARACTER OF FENCES

There is nothing to prevent a landowner using barbed wire for his fencing but, if the barbed wire constitutes a nuisance to the highway, the local authority may, by notice, require its removal, and if it is not removed they can apply to a magistrates' court for an order to remove it and can then remove it themselves at the cost of the landowner. Effective barriers can be made with certain roses, berberis and holly.

### DUTY TO FENCE

The law does not require an owner of land to fence it, but on sales of building land during the last 50 years covenants have generally imposed an obligation to erect certain fences and maintain them, so that every owner of a house may have his property fenced all round. There is no general duty to fence against the public, but, if children are permitted to trespass on land and are injured thereby, the landowner may become liable. Apart from any questions of self-interest, in view of these rules about liability towards children it is wise to keep property securely fenced.

### OWNERSHIP OF FENCES AND HEDGES

Title deeds ought to show accurately the boundaries of property with their measurements and ownership. "T" marks inside a plan indicate ownership and liability for repair.

If the deeds are silent or not clear then the facts relating to any particular case will have to be investigated to decide who owns a hedge or fence, or whether it is owned in common with the owner of the adjoining property.

Acts of repair done by one owner and the position in which trees or shrubs are planted or posts fixed may indicate ownership. Joint or party walls, hedges

or fences are not uncommon, and each party then has a right to have the hedge or fence maintained as a dividing fence and is equally liable for its maintenance and repair.

### GREENHOUSES AND GARDEN SHEDS

The erection of a building or addition to a building is controlled in the first instance by building regulations or by-laws made under the Public Health Acts. Before erecting a greenhouse, it is wise to provide the local authority with full details of the proposed house, and inquire if consent is necessary. If it is, then a plan of the greenhouse may be required. The local authority may, by building by-laws, provide that special provisions are to apply to materials specified in the by-laws which are, in the absence of special care, liable to rapid deterioration or are otherwise unsuitable for use in the construction of permanent buildings.

An owner who erects a building in contravention of by-laws may be committing a criminal offence. He may also be required to pull the building down, and if this is not done a local authority may themselves pull it down and recover from the owner the cost of doing it.

Secondly, the Town and Country Planning Acts provide that the consent of the local planning authority is necessary for all development of land. Development means the carrying out of building or other operations in, on, over or under land or the making of any material change in the use of any buildings or other land. The exception of the use of any buildings or other land within the boundary of a dwelling-house for any purpose incidental to the enjoyment of a dwelling-house does not appear to help the erection of garden sheds or greenhouses. However, a General Development Order made under the Acts has

permitted the erection without any permission of garden sheds to a height of 12 ft. for those with a ridged roof, and 10 ft. in other cases.

Since Orders can be varied more easily than Acts of Parliament can be passed it is advisable to ask the local planning authority if consent is necessary for the erection of a greenhouse or garden shed.

#### GREENHOUSES ERECTED BY TENANTS

Before a tenant erects a greenhouse or shed he should look at his lease or tenancy agreement to see whether he has to obtain the landlord's consent to do so. A tenancy agreement frequently provides that no addition to or alteration of the property let may be made without the landlord's written consent.

At the end of the tenancy the tenant may wish to take the greenhouse or shed away with him. The general law is that, if the greenhouse or shed is fixed to the ground, then it has become part of the property let and belongs to the landlord. If, however, it is just placed on the ground and can be removed without injuring the ground in any way, then the tenant can take it away since it is a tenant's fixture.

### INSECTS AND PESTS

The Minister of Agriculture may make Orders to prevent the introduction into Great Britain of any insect or other pest destructive to agriculture or horticultural crops. The term "crops" includes seeds, plants and any parts thereof, trees and bushes, and the term "insects" includes bacteria and other vegetable or animal organism and any agent causing a transmissible crop disease or fungus. Any such Order may prohibit or regulate the landing of any article which might introduce such pests and require the destruction of any such article. The penalty for breach of an Order is three times the value of the goods or £100,



whichever is the greater, or imprisonment for up to two years, or both.

The Minister may also make Orders to prevent the spreading of destructive insects, fungi or pests, and may direct the removal or destruction of any crops, trees, or bushes on which they are found in any stage of their existence, or to or by which they may be likely to spread. An inspector may enter land to examine it to see if there are any insects etc. there, and may remove or destroy any crop etc. infected, or which is likely to act as host. Orders may also prohibit the keeping or sale of any live specimens of such insects etc., or the distribution of any specimens of them.

Compensation based on their value at the time of destruction may be paid for any crops, trees or bushes destroyed by order. These orders are enforced by local authorities.

The Ministry of Agriculture has powers to serve a notice on the occupier of land requiring him to take steps to destroy certain animals, birds and bird eggs, for the purpose of preventing damage to crops, food or land. Birds protected by the Protection of Birds Act are excepted. A number of Orders have been made under these powers and these deal, among other things, with silver leaf and Colorado beetle.

### NEGLECTED SITES

An Act of 1961 provides that where on a vacant site in a built-up area there is an accumulation of rubbish which is a serious damage to amenity, the local authority may take such steps for removing the rubbish as they may consider necessary at their own expense. "Rubbish" means rubble, waste paper, crockery and metal, and any other kind of refuse (including organic matter), but does not include any material accumulated for, or in the course of, any business.

### PLANTS FROM ABROAD

Plants can be brought home from abroad only under licence. The person who has uprooted plants outside the United Kingdom and has presumably complied with the local law, is subject, when bringing the plants into the United Kingdom, to the Importation of Plants Orders, 1955 and 1959, made under Acts of Parliament of 1877, 1907, and 1927. The purpose of these Acts and Orders is to prevent the importation of diseased plants.

The first provision of the main Order, of 1955, prohibits the bringing into the country of any annual and biennial plants from places outside Europe. This is followed by a more sweeping provision prohibiting the importation of any plants from abroad unless they are accompanied by a certificate of health issued by the agricultural authorities of the country of origin.

The Minister may issue licences permitting bona fide collectors to import personally collected wild plants as passenger's luggage, or to send them through the post in a packet not exceeding 7 lb. in weight.

Application for such a licence must be made to the Ministry of Agriculture, Fisheries and Food, Whitehall Place, London S.W.1, with the address at which the plants will be retained, the countries to be visited and the date the applicant is returning to this country.

If any plants are imported contrary to the Order they must be destroyed unless an authorized officer, e.g. a customs officer, grants a licence authorizing their importation. The licence may contain conditions that the plants are to be retained by the person bringing them into the country and that any plants or seeds so retained may be examined by a member of the Plant Health Inspectorate at any time within twelve months from the date of the licence.

The penalty for a breach of this Order is a fine of up to £10 or, on a second offence, a fine of up to £50.

There is no important restriction against bringing any plants into the United Kingdom from Northern Ireland or the Republic of Ireland, but there are severe restrictions against importing plants into the latter. The general position is that no plants, trees, or bulbs grown in Great Britain may be imported into Eire except under licence obtained in advance by the importer, and subject to the production of a plant health certificate.

### SEEDS

The Seeds Act, 1920, broadly requires a seller of seeds to disclose certain essential facts about the seeds he is selling, or offering for sale, so that the buyer may judge their suitability for his particular requirements. The Act is primarily intended for the protection of the farmer and market gardener, and, to a lesser extent, the allotment holder and private gardener. With the exception of a ban on the sale and sowing of seed containing excessive amounts of certain injurious weed seeds, there is no obligation on the seller of seeds to observe minimum standards, nor is there any restriction on the buyer's free choice of seed offered for sale.

As far as the Seeds Act is concerned, seed of any description, origin or quality may be sold or offered for sale as long as certain essential facts concerning the seed are disclosed to the buyer.

The Seeds Act embraces all agricultural, horticultural and forest tree seeds, but in practice it applies only to such kinds of seed as Ministers prescribe by means of regulations made under section 7 of the Act. The kinds of seed at present subject to regulation comprise most, though by no means all, of the more important seeds sold for sowing in the United Kingdom.

The important facts which must be disclosed by the seller are the analytical purity and germination of the seed. The analytical purity of a parcel of seed refers to the presence or absence of weed seeds, inert matter and seeds of other crop plants, and is usually expressed as the percentage by weight of the pure seed in a sample of prescribed size examined under laboratory test conditions. Germination, also expressed as a percentage, is the number of pure seeds in a sample which produce a normal seedling under laboratory test conditions.

The seller of any kind of grass seed for an amenity purpose (a non-agricultural purpose) whether or not it is on the prescribed list, is not under any obligation to submit the seed to a purity and germination test or to deliver a statement of particulars to the buyer. Buyers of such grass seeds and also the buyers of flower seeds get no protection under the Seeds Act and rely solely on the skill, judgment and reputation of the seedsmen in making their purchases. They also rely on the skill, judgment and reputation of the seedsmen who supply sealed pictorial packets of seeds. The Report of the Committee on Transactions in Seeds, of November 1957\* recommends that these laws should be changed and that buyers of amenity grass and flower seeds should receive additional protection. Nothing has so far been done to implement the recommendations of this Committee.

### TREES

A garden owner may cut off branches of a tree or shrub belonging to his neighbour which overhangs his soil and he may do this without notice to his neighbour, but he may not go on to his neighbour's land to do it. Any branches which are cut off, the fruit growing on them,

\* Cmdnd. 300. H.M. Stationery Office, Kingsway, London, W.C.2.

and any fruit which falls from overhanging branches all belong to the owner of the tree. A man may cut his own branches which overhang his neighbour's property but he must do this as carefully as possible, and he should give notice to his neighbour before he does it if the branches are likely to fall and damage his neighbour's land. Roots of trees which encroach on neighbouring land are considered to be in the same category as overhanging branches and may be cut in the same way.

#### DANGEROUS TREES AND HEDGES

A person who has a hedge or tree which constitutes a danger to occupiers of adjoining land or persons using a highway, is liable under the law concerning nuisance for damage resulting to those persons if he knows or had means of knowing of the danger and allows it to continue.

#### POISONOUS TREES

The owner or occupier of land who lets poisonous trees, such as yews, grow over someone else's land is liable for any

injury they do, for example, if his neighbour's cattle eat them and die. He might also be liable if he constantly allowed children to trespass on his land and they ate poisonous berries.

#### WEEDS NEXT DOOR

There is a section of the Town and Country Planning Act, 1947, which appears to give a local planning authority power to deal with any garden or vacant site which is injuring amenities. Although an untended garden might fall within the section, the precise scope of the section is not altogether clear, and proof that weeds were spreading might not alone be sufficient.

Under the Weeds Act, 1959, however, the Ministry of Agriculture, or any local authority to whom they have delegated the power, may require an occupier of land to take steps to prevent the spreading of injurious weeds. The Act applies to the following weeds and to such additional weeds as may be prescribed: spear thistle, creeping or field thistle, curled dock, broad-leaved dock, ragwort.





# Nature Calendar

NATURE observes no strict time-table, and to begin a Nature calendar on New Year's Day is to set an artificial limit to the cycle of plant and animal life. Climate, above all, determines what will be seen in garden and field at any given time of the year. In a mild, wet season, plants may appear as much as a month earlier than usual, while in a cold, dry season they may be a month later. Similarly, observers in southern districts of the British Isles will usually be able to

see these plants earlier than those in the north. The habits of animals, birds and insects are governed to a certain extent by the appearance of the plants on which they depend for food as well as by climate.

This calendar is a general guide to Nature's activities. It covers both wild and garden life, for apart from helping the Nature observer, a knowledge of Nature's routine can be exploited to plan a garden in which interest can be sustained through all seasons.



## JANUARY

### WEATHER

January is often a windy month, with moderate rainfall, and snow when the temperature is low enough. The first part of the month is frequently milder than the latter part.

### FLOWERS

A surprising number of flowers can be seen during the bleak month of January. In the garden the lovely Christmas rose, *Helleborus niger*, is in flower, as well as *H. corsicus*. The yellow *Iris danfordiae* appears in sheltered positions, while chionodoxas make a splash of brilliant blue as the snow melts. The yellow winter aconite and the snowdrop, both of which

grow wild in many localities, make their early show of colour this month.

A few wild flowers bloom throughout the winter, including such weeds as chickweed and dandelion.

### FLOWERING SHRUBS

There is still an abundance of winter jasmine, and the winter-flowering honeysuckles are also in bloom, although their branches are bare. Azaras flower against sheltered walls, and *Erica darleyensis* begins to bloom. The dangling catkins of the hazel are conspicuous, and may start to lose their pollen by the end of the month.

### BERRIES

Many evergreens still have brilliant berries. The yellow-berried holly and the brightly polished red berries of *skimmia* look particularly fine. The ivy has hanging clusters of green fruit. Among the deciduous shrubs, the orange berries of

*Hippophae rhamnoides* persist, since they are unappetizing to birds. White snowberries hang on leafless twigs, and the related *Symphoricarpos orbiculatus* has clusters of coral-pink berries.

## BIRDS

Many birds move in flocks from communal roosts to feeding grounds in fields and in woods. Among these are wood-pigeons, rooks, starlings and jackdaws; chaffinches and other finches; thrushes, tits, and the smallest British bird, the goldcrest. Pewits (lapwings) spend most of their time in the fields.

Flocks of ducks, especially mallard, teal and tufted duck, can be seen on lakes and reservoirs. Moorhens abound on most waters, and coot on the larger lakes. Gulls are seen on stretches of inland water and on deserted beaches. Here, too are plovers, curlews and other waders.

Some birds come into song early in the

winter, and by January, except in the most severe weather, thrushes and sparrows can be heard, as well as the robin, wren, skylark, great tit and nuthatch. Before the month is out, the blackbird and chaffinch will join them.

## INSECTS

January is not a month in which insects can be seen generally, though a few mild days will bring out some of the hibernating moths and butterflies for a brief period. The dancing flight of gnats will continue throughout the winter.

## ANIMALS

Despite the cold weather, the first lambs are often to be seen. Squirrels scamper through the woods, searching for the nuts that they have hidden, and the badger too sometimes emerges from its winter quarters to hunt for food. A tree stripped of its bark indicates the passing of hungry deer.



## FEBRUARY

## WEATHER

This month is generally not so wet as January, but the early part may be the coldest period of the year.

## FLOWERS

Early crocuses such as *Crocus imperati* are in flower. The rampant *Petasites fragrans*, though growing so vigorously as to be regarded as a weed, is welcome for its fragrant white flowers.

Among the wild flowers, the lesser celandine is the first member of the buttercup family to flower. Coltsfoot,

which sometimes grows as a weed in cultivated ground and is fairly common on waste ground, opens a little later. Dog's mercury is the first woodland flower, followed by barren strawberry, which is more often found on hedge banks.

## SHRUBS AND TREES

Flowering shrubs and trees are much in evidence in February. There are caterpillar-like catkins on the yet-leafless aspen, and the hazel has small, red, female flowers as well as cowslip-scented catkins. Alder catkins hang silhouetted against the bare branches. The silky tassels of *Garrya elliptica* come into flower at this time, as do the hardy dogwoods, *Viburnum tinus* and the parrot or iron tree (*Parrotia persica*). The attractive flowers of

*Erica carnea* Springwood Pink appear alongside the spidery blooms of witch-hazel and the sweet-scented *Daphne mezereum*.

Other trees and shrubs are none the less striking for having no flowers. The blue cedar is particularly conspicuous for its colour, as are all the ivies, with their shining leaves. The purple, red or pink berries of the pernettyas, which persist for most of the winter, contrast with the new golden growth of young willows. If growing in a sheltered position, elder and honeysuckle will also begin to show their first leaves as soon as there is a mild spell.

#### BIRDS

Flocks of birds will still be seen, but they will now vary in content and number. Starlings, black-headed gulls, rooks, jackdaws, pewits, house sparrows, pied wagtails and finches will be quick to follow the farmer as he prepares for spring sowing. The goldfinches, and other acrobatic feeders such as siskins, redpolls and tits, are attracted to alder catkins.

Lakes and streams may freeze over in

February, and a mixed collection of waterfowl will therefore visit any open water. The birds seen in January may be joined by geese and even herons. All these species will move to open estuaries or beaches if all inland waters freeze up.

Birdsong will increase in volume, the yellow hammer and blue tit being perhaps the best known of the species that start singing in February.

#### INSECTS

No insects will be seen if the month remains cold, but as soon as there is a warmer day the bumble bees will be out.

#### ANIMALS

The occasional day of milder weather will encourage stoats and weasels to search for holes in hedges and banks in which to make their nests. Young rabbits are already being born in specially prepared underground nurseries or "stops". Some are killed by badgers, whose footprints can now be discovered in the damp earth. Old birds' nests can sometimes be found filled with the remains of the winter feasting of field mice.



## MARCH

#### WEATHER

The traditional March winds may be expected to roar sometime during the month, but there will be compensating mild, still days as spring approaches.

#### GARDEN FLOWERS

Many flowers appear with the first signs of spring. Muscari are beginning to

bloom in most gardens, as well as all varieties of crocus. The early saxifragas, including the wild golden saxifrage, are starting to flower, and the bergenias will also appear, but may be damaged by frost. *Narcissus bulbocodium* is in flower, as well as the first daffodils and the short-stemmed *Iris unguicularis*, which has been blooming intermittently all winter. The hardy cyclamen *Cyclamen coum* produces its frail pink blooms, which contrast well with the various blues of early gentians. The young fronds of many ferns begin to unfurl this month.



## WILD FLOWERS

Woodland flowers to be found now include the wood anemone (*Anemone nemorosa*), and, later in the month, the wood sorrel. Primroses, which are found particularly on sheltered banks, are in full flower. The kingcup and butterburr will be seen near streams and in open woodland. Sweet violets, greater stitchwort, ground ivy and moschatel appear on hedge banks, with such weeds as the daisy, hairy bittercress and many kinds of speedwell.

## SHRUBS AND TREES

Flowering shrubs and trees again dominate the scene, the bright yellow of forsythia being especially showy. *Magnolia stellata* and *M. soulangeana* are in bloom. Camellias and *Abeliophyllum distichum* will flower in sheltered positions, and *Mahonia aquifolium* makes a colourful display. Stiff flower spikes hang from the bare branches of *Stachyurus praecox*. Several of the chaenomeles (japonica) are in flower, and the buds of the lilac are swelling. Once the cold winds die down, the almond will produce its beautiful deep pink blossom.

The flowering of the blackthorn (sloe) is said to coincide with one of the season's cold spells. On the other hand, the catkins of the sallow, known as pussy willow, open when warmer weather brings out the first spring insects. The first dull-red flowers of the elm also appear.

The leaves of the hawthorn start to show, and the new red leaf growth of the roses can be seen. The architectural beauty of dwarf conifers is conspicuous in the rock garden.

## BIRDS

Once the cold weather breaks, the flocks of birds thin out, and there is a tendency for them to move about in pairs as the days lengthen. The rooks begin rebuilding their nests in earnest. Other early nesters are woodpigeons, thrushes, blackbirds and, among the water-fowl, mallard, moorhens and coot.

The first migrants are now due, among them the wheatear and the chiffchaff, which sometimes winters in the mild south-west of the British Isles. Even the first swallow may arrive in March.

## INSECTS

The few British butterflies that pass the winter as adult butterflies emerge from hibernation. These include the small tortoiseshell, the peacock and the comma, all of which can be seen feeding in gardens, where they lay their eggs on young nettles. The brimstone also appears in March, but usually stays in the woods on the buckthorn plants.

Ladybird beetles are also due to leave their winter quarters, and the seven-spot and two-spot varieties visit gardens to feed on greenfly.

## ANIMALS

Young badgers and fox cubs are born in March, and young hares can be found lying in the shallow depressions in the ground that constitute their nests or "forms". The antics of the adult male hares justify the description "mad as a March hare". In the ponds, toads are beginning to lay their long strings of eggs.

Grass snakes, adders and lizards come out to sun themselves on warmer days.



## APRIL



## WEATHER

Thunder, hail and showers are not infrequent. Generally, rainfall is not high, and temperatures rise steadily.

## GARDEN FLOWERS

Early tulips provide a splash of colour in April, and dicentra, trilliums and periwinkles start to flower. Hyacinths now flower in the open garden, with the small bulbous irises, and carpets of daffodils. Muscari are still blooming, and are joined by forget-me-nots, wallflowers, *Fritillaria meleagris* and *Doronicum plantaginifolium*.

In the woodland garden Lenten roses are at their best.

## THE ROCK GARDEN

The rock garden now comes into its own. Polyanthus make a gay display, with some primulas among the shrubs, and there are still plenty of primroses. The violas are opening and mounds of mossy saxifragas are covered with buds. There are anemones and arabis with bright cushions of aubrieta and pasque flowers growing between the stones.

## WILD FLOWERS

April brings an abundance of wild flowers, too. The buttercup is common along the roadsides, but the daisy, pearlwort and woodrush prefer shorter turf, such as garden lawns. Other weeds in the garden at this time include groundsel, shepherd's purse and annual grass.

The hedge parsley sometimes produces a few flowers in April. Other roadside flowers to be seen now are the wild arum,

usually known as lords and ladies or wake robin; dove's-foot crane's-bill and herb Robert, both members of the geranium family; and the common violet. The cuckoo flower is found in damp places.

In the woods, bluebells, red campion and yellow archangel are at their best before the trees come into leaf, and where timber has been felled and the copse-wood cleared, these flowers produce magnificent drifts of colour.

## TREES AND SHRUBS

In April the first leaves appear on horse chestnut, mountain ash and larch. In the garden, *Viburnum burkwoodii* and *Erica arborea* are in flower, soon to be joined by the cherries and the fragrant sprays of pieris. *Choisya ternata*, too, may begin to bloom.

## BIRDS

Many resident birds will be nesting, and a few young birds from the early March nests will already have fledged.

Most of the migrants are now on spring passage: more chiffchaffs and then the willow warbler and related species arrive and swallows begin to pass in increasing numbers. House martins, sand martins and swifts will also be seen before the month is out. Two other well-known birds are due in April: the cuckoo and, somewhat later, the nightingale.

Waterfowl will have left their winter quarters by now and flown north and east to their nesting grounds by stream, lake or marsh. The waders, in particular, will have assumed their breeding plumage, so colourful that they appear to be different species from those seen in much plainer feathers during the winter.

## INSECTS

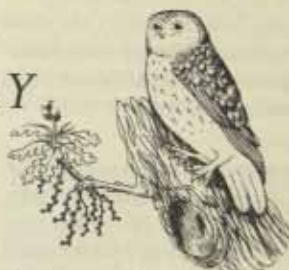
The butterflies that spent the winter as chrysalides are hatching out on warm

days. The small garden white visits gardens to lay its eggs on green vegetables; the orange-tip and the green-veined white are more likely to be seen in damp meadows. The speckled wood flutters along woodland drives where there is partial shade, and the holly blue visits shrubberies or open woods where it can find holly and ivy.

## ANIMALS

The hedgehog, which may have been seen on warmer days during the winter, emerges from hibernation. Fresh green shoots in the woods may fall a prey to squirrels, whose young are born at this time. Field mice begin their long breeding season, although their numbers are kept down by stoats and weasels.

## MAY



## WEATHER

A warm spell towards the end of the month usually confirms the arrival of spring, but there are often frosty nights to worry the farmer and gardener.

## GARDEN FLOWERS

Tall, stately tulips are perhaps the most conspicuous of the many flowers to be seen in the garden in May; parrot tulips add a particularly exotic note to the spring border. Forget-me-nots are still in flower; jonquils and showy clusters of trolilius now add their colour, and tall verbascums are beginning to bloom. Siberian wallflowers make a striking bedding plant, while the great buds of the paeonies are starting to burst. In the bog garden, caltha is in flower, and primulas are opening by the water side. London pride flowers now, and in the rock garden the lilac-coloured heads of *Ranunculus myconi* appear.

## WILD FLOWERS

Roadside grasses are growing fast and beginning to flower, including several species of brome grass, with their long, nodding panicles.

Ox-eye daisy, bush vetch and red clover are all in flower now, and on rougher ground birdsfoot trefoil can be found, with wild strawberry, scarlet pimpernel and mouse-ear hawkweed.

In the woods are bugle, early purple orchis and ransom; by streams, yellow flag and ragged robin; in wet meadows, the early marsh orchis; and in boggy ground, the cotton grass.

## TREES AND SHRUBS

Among the last of the trees to break into leaf are beech, oak, ash and walnut. Latest of all is *Catalpa bignonioides* whose pale green heart-shaped leaves contrast with the colourful young foliage of various species of acer.

The hedges are now thick with hawthorn or May blossom, and horse chestnut, mountain ash and crab-apple are also in flower. In the garden, some of the pink tamarisks are already flowering freely, and berberis and *Fabiana imbricata* are in full bloom. Azaleas and rhododendrons make brilliant splashes of colour. Tree paeonies and laburnum are flowering, and lilac scents the air. *Clematis montana* and the delicate mauve or white flowers of wisteria decorate many walls. There are still pink buds on the pear trees, interspersed among snowy white blossom.



## BIRDS

Birdsong is at its height, starting before dawn and dying down as the sun rises. At dusk there is another performance of lesser volume and shorter duration.

The last migrants arrive, including the tree pipit, the spotted fly-catcher and the turtle dove with its purring, monotonous song. Two other late arrivals, the nightjar and the grasshopper warbler, settle in the woods or on scrub heathland. They can be heard there at dusk, with such residents as the pheasant, the tawny (wood) owl and the little owl. Snipe and woodcock frequent wetter places. In the garden, noisy, insistent young blackbirds, thrushes and starlings demand food from busy parents.

On the shore, many waders will still be passing, making for northern breeding sites; in their place, terns will be nesting.

## INSECTS

More butterflies emerge during May, and the large cabbage white is particularly common in gardens and woods. Many small butterflies can be seen on close-cropped commons, including the small heath, common blue and small copper. The dingy and grizzled skippers are also there, though they might be mistaken for

moths. The green hairstreak settles on bramble bushes; the wall butterfly rests on bare ground, stones and fences; and the pearl-bordered fritillary stays at the edge of woods and clearings.

Moths increase in number as the days lengthen and become warmer, and many are attracted to lighted windows at dusk. Beetles, too, fly at dusk, and that pest of woods and near-by gardens, the cockchafer, often comes indoors.

Dragon-flies are beginning to appear, and already the four-spotted libellula can be seen near boggy areas. The much smaller damselflies emerge from lakes, ponds and streams, and range over a wide area. The most common are predominantly blue in colouring, among them the common blue damselfly, the common ischnura, and the common coenagrion. The larger red damselfly frequently accompanies them.

## ANIMALS

Rats frequent human habitation, streams and river banks in search of food. Un-sightly hillocks may appear on lawns as evidence of the presence of moles, whose young are born this month.

Antlers cast by stags can sometimes be found in the woods.



## JUNE

brings welcome summer warmth. It is often the sunniest month of summer.

## GARDEN FLOWERS

This is the month of roses; of the many species that reach perfection at this time, the deep red of *Rosa moyesii* and *R. hugonis*, with its graceful arches of yellow flowers, are among the most striking.

The herbaceous border is also a kaleidoscope of colour, with poppies, potentillas, paeonies, and tall spires of lupins.

## WEATHER

Even allowing for the many unexpected changes in the British climate, June is one of the driest months of the year, and

The passion flower is of special interest, and stocks scent the evening air. The graceful arches of Solomon's seal are white with flowers, and the great trumpets of the day lily are also open, though each bloom lasts for only one day.

Many varieties of iris are already in bloom, but the long season for scabious and for the blue *Omphalodes cappadocica* is only beginning. Geraniums and alliums, candytuft and campanulas are all in flower, while columbines shake on their wiry stems at the faintest breath of wind.

Window-boxes and hanging baskets make colourful displays.

#### WILD FLOWERS

Hay-making, hedge-trimming and verge-brushing are in full swing in June, but on untouched roadside hedges honeysuckle, bramble, elder, dog rose and field rose should be at their best. Under the hedges and on the commons, the more noticeable of the many summer flowers are the poppy, silver-weed, cranesbill, toadflax, St. John's wort, ragwort, agrimony, hogweed (cow parsnip), goosegrass (cleavers) and willow herb. Hop trefoil and others of the clover family are now in flower, as well as yarrow and the first thistles.

Certain flowers, including wild mignonne, rest harrow, stonecrop and rock-rose, are confined to chalk and limestone areas. There, too, are the yellow-flowered rough hawkbit and ox-tongue. Out on the dry commons are milkwort, with deep blue flowers that pale to white; and pink centaury, growing among heath bedstraw, creeping cinquefoil, and the four-petalled tormentil.

In woodlands, foxglove flowers profusely where the timber has been cleared, whereas the dainty enchanter's nightshade likes some shade. The lesser spearwort thrives in wetter places, while at the edge of the water is the taller water dropwort, and in the water itself several varieties of water crowfoot.

#### FLOWERING SHRUBS AND TREES

This month also brings the sweet, heavy, all-pervading scent of lime flowers, and several shrubs and trees provide colour in June, including *Buddleia alternifolia*, which is decked with tiny mauve flowers.

#### BIRDS

Birdsong is diminishing by now; nightingales and robins cease singing by the middle of the month, and cuckoos, blackbirds and others also become silent as the year moves towards midsummer.

Large numbers of swifts spend many hours feeding on the wing, flying high on warmer days to take the rising flies.

On lakes, mallard drakes begin to moult and grow their duller, non-breeding plumage. Gulls nest on cliff ledges and shingle beaches, alongside the terns with their distinctive forked tails.

#### INSECTS

The most common of the British brown butterflies, the meadow brown, is often seen in June. The small pearl-bordered fritillary frequents the damper woods and marshy fields, while large and small skippers stay near the edges of woods and on rough commons. By the end of the month, the ringlet can be seen in country lanes and woodland rides.

Summer broods of many spring butterflies are due, including the small white, the small tortoiseshell and, less common, the comma. Migrant clouded yellow are now feeding in clover and lucerne fields.

The migrant humming-bird hawkmoth visits gardens in June to feed at the petunias. Day-flying moths found on commons include the cinnabar and the five-spot and six-spot burnets; the empty cocoon cases of the latter are often seen fixed to the stems of grasses.

Two damselflies seen for the first time this month are the demoiselles *Agrius virgo*, with partly shaded wings, and *A. splendens*, with fully shaded wings. Both

frequent tall plants and trees near the streams from which they have recently emerged.

## ANIMALS

This is one of the few times of the year when it is possible to see that nocturnal

creature, the badger; on warm evenings, at twilight, a whole family may be abroad in the woods. There, too, young foxes can be seen at play. Natterjack toads can be heard calling loudly at this time of year, while frogs help the gardener by devouring insects and slugs.



## JULY



## WEATHER

July is frequently a wetter month than June, but weather permitting, the harvest progresses. The latter part of the month and the early part of August, are considered the peak of high summer.

## GARDEN FLOWERS

Daisies add colour to the border in July. Bold groups of phlox make a gay display alongside sedums, astilbes, bergamots, cornflowers and *Achillea* Gold Plate, and the white or yellow spikes of *lysimachia*. Pansies should continue to flower if the dead heads are removed. Annual nasturtiums are blooming, and antirrhinums are at their best. Roses can be cut freely for indoor decoration, and begonias are beginning to flower. Tubs are bright with velvety coleus, *Aethionema* Warley Rose is blooming in the rock garden, and in the pool the water lilies are opening.

## WILD FLOWERS

Heather is one of the main attractions in July, including the purple-flowered bell heather of the drier moors and commons and the pink-flowered cross-leaved heather on wetter moors and bogs. Ling flowers somewhat later, while bilberry grows best on northerly sites and in partial shade. Sometimes the small red flowers of dodder, a parasite on heathers, can be seen, and the yellow of dwarf furze often provides a further contrast.

Several bellflowers related to the

Canterbury bell are in flower—harebells in dry places; the taller nettle-leaved bellflower on hedge banks in the south; and the great bellflower farther north.

Greater bindweed is flowering now, twined among roadside hedges, as well as traveller's joy, though this is confined to chalk and limestone soils in the south. On dry banks and in the woods are wood sage and golden-rod, and on the verges wild carrot and wild parsnip. Great willow-herb, meadowsweet, marsh valerian, gipsywort and great water dock are seen on damp ground, and sundew and bog asphodel in quite boggy places.

## FLOWERING SHRUBS

Lavender is in full bloom, and the heads are ready to be cut and dried for lavender bags. The summer jasmine, *Jasminum officinale*, is covered with fragrant white flowers, while *Erica vagans* and the spiky flowers of yucca are starting to bloom. Buddleias are still a mass of colour, and there are purple, feathery flowers on the smoke tree, *Rhus cotinus*, matching the blooms on several varieties of *Clematis jackmanii*. The pink or red flowers of escallonia blend very well with the bold, deep carmine of *Fuchsia magellanica* and



*F.m. riccartonii*. Deutzias, too, are in bloom.

## BIRDS

The woods are almost silent now on hot, sultry days, for few birds are singing. A number of second broods are still unfledged and some birds have a third brood to hatch and rear. For many, however, this is the turn of the year. Their breeding season is over, and they can now range freely in search of food. Some species gather into flocks, and the first swallows may assemble on the telephone wires late in the month—the start of a leisurely movement southward.

## INSECTS

The summer broods of several butterflies will be seen in the garden this month, including the peacock, the holly blue, the brimstone and the wall. The brown argus and silver-studded blue stay on the short-turfed commons, while the chalkhill

blue and the grayling are seen on limestone soils. The hedge brown frequents both commons and country lanes, often settling on bramble bushes.

The dark green and silver-washed fritillaries fly over commons, but the high brown fritillary is restricted to the woods, as is the purple hairstreak. The latter, though common, is often difficult to see, as it flies very high and settles at the top of tall oak trees.

Mosquitoes, midges, clegs, and other biting flies are uncomfortably plentiful in the woods at this time.

## ANIMALS

The hedgehog, a welcome visitor to the garden since it eats snails and slugs, produces its young in July. In the woods, young deer are also born at this time.

Newts, which lay eggs on the leaves of water plants, can still be seen in ponds.

## AUGUST

## WEATHER

Like July, this may be a wet month, although there are usually periods of fine weather too. The days begin to shorten towards the end of the month.

## GARDEN FLOWERS

There is already a suggestion of autumn in the garden, for Michaelmas daisies are beginning to flower in the border. Dahlias, too, make a fine display, with Korean and other early-flowering varieties of chrysanthemum. The strong colours of the zinnias vie with red hot pokers, polygonums, marigolds, and late gentians. Plenty of heleniums are available for cutting, and golden rod, ligularia, and delicate mauve and blue salvias are also in flower now. Hollyhocks tower over the hedge, and near-by, perhaps, there is a brilliant display of verbenas.



The delicate flower spikes of the hostas contrast well with their bold leaves, and autumn-flowering cyclamen such as *Cyclamen europaeum* are blooming.

The yellow flowers of evening primrose have an ethereal appearance as they open at twilight, and in the rock garden there are further splashes of yellow, for the hypericums are in bloom.

The rose garden is still colourful. Wichuraiana, rambler and miniature varieties are all in flower.

## WILD FLOWERS

Perhaps the most interesting wild flowers to be seen in August are those that grow by the sea. Many plants can be found on the shingle, such as curled and golden docks, creeping thistle, ragwort, dandelion, yellow-horned poppy and sea campion. Orache and sea thistle grow on the more fertile parts of sandy beaches, as well as saltwort, sea holly, viper's bugloss, knapweed, centaury and sea beet. Wall barley and sea sandwort are found at the edge of the dunes among a variety of grasses. Where the dunes are well established, lady's bedstraw, sea bindweed, cat's ear, scarlet pimpernel, and grasses begin to merge with inland flora. Cord grass thrives on the sea marshes, interspersed with sea aster and sea lavender. Sea thrift grows here too, and on the beaches, but looks its best on cliffs with the yellow-flowered shrub, samphire.

## FLOWERING SHRUBS

Among the garden shrubs, spiraeas are still scattered with pink or white blossom, and both honeysuckle and hibiscus are in flower. The great lush trees of *Magnolia grandiflora* are a magnificent sight.

## BIRDS

Swallows on their journey south will be seen on most days, often pausing for rest on telephone wires, while house martins gather on the sunny side of roofs. Both these species and the sand martins will be seen for several weeks. Swifts do not stay as long, and by the middle of the month will have left their breeding sites.

Robins, which have been quiet while they moult, now come out, each singing an autumn song to assert possession of his own chosen portion of the garden. In

the fields, as the harvest advances, flocks of pewits, starlings, woodpigeons and finches gather to feed on the stubble.

Waders, which began to leave their breeding grounds in July, now frequent estuaries and the edge of lakes, where the water is shallow enough for them to wade in search of food.

## INSECTS

During the warmest days of early August there are more species of butterfly on the wing than at any other time. All those seen in July are still present, and are joined by the second broods of the common blue and small heath. But about the middle of the month the evenings become colder, and as summer turns to autumn the number of butterflies decreases.

Many dragon-flies are hunting over the lakes and even stray some distance overland. Both the brown aeshna and the smaller red common sympetrum will remain right into the autumn. There are also a few damsel-flies still to be seen.

The garden ant takes wing on its marriage flight during hot weather at the beginning of the month.

## ANIMALS

August is the month of ripe corn, and in the fields the tiny harvest mouse can be seen, swinging like an acrobat on the ears of corn. Voles multiply at a phenomenal rate at this season, and were it not for attacks by stoats and weasels, they would soon devour all green stuff in the garden. Badgers also perform a useful service by digging out wasps' nests.

Many young lizards and snakes can be seen now, including the grass snake, which hunts in the water, eating insects and small rodents.



## SEPTEMBER



## WEATHER

September is generally recognized as the beginning of autumn, and towards the end of the month the first frosts may be recorded. This may be a drier month than either July or August.

## GARDEN FLOWERS

The herbaceous border still has gay clumps of Michaelmas daisies, and dahlias have now reached show standard. Chrysanthemums, too, make a fine display. Autumn-flowering gentians, such as *Gentiana sino-ornata* are in bloom, with tradescantia, cimicifuga and tree mallows. *Anemone japonica* and *Echinacea purpurea* are also flowering in the border against a foil of the attractive silvery foliage of artemesias. *Verbena bonariensis* will continue to bloom until the first frosts. Many roses are now flowering for the second time. Ferns display a dazzling range of autumn colouring before being cut down by frosts.

## WILD FLOWERS

Fleabane is common on many roadsides, and ivy is in flower. When grown on the walls of houses, the latter attracts blue-bottles, which tend to find their way indoors through open windows. The autumn crocus, rare as a wild plant, flowers at this time, and the related meadow saffron can be seen in damp meadows.

## SHRUBS AND TREES

The huge purple flowers of the sumach or *Rhus typhina* bloom in September; the deep cerise flowers of *Erica* Mrs D. F. Maxwell are also at their best now, and *Clematis* Lady Betty Balfour is still in

bloom. The strawberry tree is particularly interesting, for it produces flowers and fruit at the same time.

The first leaves are beginning to turn, and the acers are clothed in exciting autumn colour. The leaves of the Virginia creeper should be a bright scarlet by the end of the month.

## BERRIES

September is the season of ripe fruits and seeds. Blackberries are plentiful for picking and elderberries are ripe. The colourful fruits of the rowan or mountain ash and the juicy berries of the yew are eaten by birds, particularly thrushes, as soon as they are ripe. Hawthorn berries deck the hedges, and although these are safe for children to eat, the fruits of the woody nightshade and the honeysuckle are poisonous and should be avoided.

In the garden, *Viburnum lantana* bears attractive umbels of berries, and the branches of the berberis are strung with translucent red or purple fruits.



## BIRDS

In the south, the last of the migrants can be seen in large numbers. The adult males are now moulting from breeding to winter plumage, and the young birds, though fully grown, are in dingier dress and look much like the females.

The willow warbler visits gardens again briefly, with the chiffchaff, easily



recognized because it is in song. The wheatear is more frequently seen on the open commons.

As long as the weather remains settled and warm, some of the waders will stay for a time at suitable feeding places inland. Among these are the common sandpiper, green sandpiper and ringed plover. Quite large flocks of mallard and tufted duck gather on lakes. Black-headed gulls are there too, or on the fields where autumn ploughing has started.

#### INSECTS

There are still plenty of butterflies feeding at garden flowers on sunny days. Most interesting are the migrants, which are beginning their southward movement. The red admiral visits Michaelmas daisies, while painted lady and clouded yellow are seen on clover flowers in the

meadows or on hawkweed among the stubble. A fairly common migrant moth, the silver Y, is often found at dusk on petunias, single dahlias, or late flowers of red valerian.

Daddy-long-legs are plentiful in the fields, and frequently come indoors.

#### ANIMALS

As summer turns to autumn, dead shrews are a common sight in the countryside, for the life of this tiny animal, though a full and active one, is very short. The dormouse is busy eating the hazel nuts as they ripen, storing enough energy to enable it to survive its long winter sleep. The squirrels, though they do not hibernate, are also gathering and storing nuts and, in the wood, the fox can be seen in its autumn clothing of brilliant russet red.

## OCTOBER

#### WEATHER

The quietness of September may be extended well into the month. But October, the wettest month of the year, often brings the first fogs of the winter.

#### GARDEN FLOWERS

There are fewer flowers in the garden now, though aconitum and the graceful Kaffir lily, *Schizostylis coccinea*, are colourful. *Helianthus sparsifolius* still has striking yellow flowers, while *Sedum Autumn Sun* fully justifies its name. Several veronics are still flowering, and in the rock garden the bright blue flowers of *ceratostigma* predominate. Some garden flowers, such as honesty, now have papery seed pods that can be used as indoor decoration.

#### WILD FLOWERS

In woods and on rough pastures stand the dry stems of summer flowers with their empty seed-heads. Where road



verges have been trimmed the regrowth of grass is lush and soft. Buttercup and clover, dog-daisy, dandelion, speedwell and thistle flower again with the autumn-flowering yarrow, knapweed, cat's ear and hawkweed.

Behind the combines and balers, the stubble fields show the new growth of spilt corn and weeds.

#### SHRUBS AND TREES

*Erica tetralix* is still in bloom, and the flowers of *Daboecia cantabrica* also persist.

Many leaves are turning now, and if the weather is kind, the autumn tints will be at their best towards the end of October. The lilac-purple fruits of the *callicarpa* are accentuated by the soft pink leaves. The warm brown of beech leaves is most attractive, and there are other shades of brown on oaks and sycamores. The brilliant red of the cherry leaves is often missed, because they fall so soon after turning. Ash leaves fade to a paler green, and those of elm and elder turn yellow.

The leaves will begin to fall with the first frosts and autumn gales. A frost hard enough to cut the dahlias will bring down all the leaves of the walnut and affect even the hardy ash.

#### BERRIES AND NUTS

Berries are still plentiful, ranging from the red ones of the *viburnum* to the blue, grape-like clusters on *Mahonia aquifolium*.

Nuts of all kinds ripen at this time—cobnuts, filberts and walnuts can all be collected. The nuts of the hazel and the sweet chestnut are also ripe, and there are acorns on the oak. The “conkers” of the horse chestnut fall now, and the keys of the sycamore are often seen winging across the garden on the autumn wind.

#### BIRDS

A few solitary swallows and house martins may still be seen near the south coast. In their place, the winter migrants are arriving, some of them so well known that they are accepted as natives. Pewits and starlings may have come from as far

east as Poland or even Russia. Continental tits and finches arrive too, with robins and blackbirds. Two members of the thrush family that are easily distinguished by their plumage and call are the fieldfare and the redwing.

In the fields, flocks of birds have increased, for there is plenty of food available as the land is ploughed for winter sowing. In the evening, only the pewits remain in the fields. Rooks and jackdaws return to roost in woods they have been using for centuries; starlings roost on buildings and in reed beds and shrubberies; wood pigeons also return to woods, and gulls to lakes and reservoirs.

#### INSECTS

Fields and hedges are covered with gossamer, the intricate webs of money spiders. Covered with dew, and seen in the slanting light of the setting or rising sun, gossamer imparts a silvery sheen to the landscape. Money spiders may number more than 2,000,000 to the acre at this season, and on still, warm days they can be seen floating to new sites on gossamer streamers.

Most hibernating insects retire to their winter quarters in October.

#### ANIMALS

Several well-known animals are also beginning to disappear from the scene. The dormouse is seeking out the home in which it will spend the winter, and soon the hedgehog will hibernate, though it may still venture abroad occasionally in all but the coldest weather.



## NOVEMBER



## WEATHER

The warm days of an "Indian summer" may make the early part of November an extension of autumn. But the later part usually brings the frost, fog and sunless days of winter.

## GARDEN FLOWERS

The Kaffir lily still provides a welcome splash of colour. The hardy evergreen climber *Clematis calycina* comes into flower in November, and in the rock garden there are still a number of hardy gentians.

## WILD FLOWERS

Some roadside flowers bloom for the second time now, among them daisy, dandelion, hawkweed, hawkbit, jack-by-the-hedge, red and white deadnettle, and even the violet. As one generation of garden weeds follows another throughout the year, chickweed, shepherd's purse, groundsel, annual grass and others still can be seen.

## SHRUBS AND TREES

One of the most decorative trees at this time of year is the evergreen *Arbutus hybrida*, with its red bark and clusters of white flowers. Hardy varieties of *Erica*, and *Veronica* such as *Veronica angustifolia* and the beautiful *V. speciosa* Autumn Glory are still in flower, as well as all the ivies. *Prunus subhirtella autumnalis*, the fragrant *Lonicera standishii*, and the winter-flowering Glastonbury thorn (*Crataegus monogyna praecox*) are just beginning to bloom.

After the frosts, the last leaves of beech and oak will fall in the autumn gales and the larch, a notable deciduous conifer, will drop its needles.

## BERRIES

Cotoneasters are particularly striking at this time, as they have bright red berries as well as tinted leaves. Orange and pink spindle berries, *euonymus*, contrast with the scarlet berries of similar shape of another climber, *Celastrus articulatus*. Both are easily recognized, for they split to reveal a bright lining. The hardy and decorative *Pernettya mucronata* has purple or red berries.

## BIRDS

Robins are in full song, hedge sparrows and thrushes can be heard, and wrens are singing in woods and shrubberies.

The flocks of birds will persist until the spring, though fluctuating in size and composition. A chaffinch flock, for instance, may include smaller flocks of bramblings, greenfinches, linnets, yellowhammers and buntings; tree sparrows may gather with the house sparrows.

## INSECTS

A few moths can still be seen on warmer evenings, among them angle shades, sword-grass, and silver Y. The red admiral and small tortoiseshell butterflies also venture out on sunny days.

## ANIMALS

The red squirrel, now rare in the British Isles, looks its best in November, with its rich chestnut brown coat, tufted ears and bushy tail. Some bats do not go into hibernation until the end of the month, the pipistrelle, in particular, being seen on the mildest evenings.

Newts have now left their ponds, and are hibernating in crevices near the water.



## DECEMBER



## WEATHER

December is the month of least sun but not necessarily of the coldest weather.

## GARDEN FLOWERS

A few hardy flowers still brave the elements, including *Adonis amurensis* and the little *Iris unguicularis*, which will continue to bloom intermittently throughout the winter. Several hardy varieties of crocus can be seen already in sheltered positions. The tiny *Monardella macrantha*, with its scarlet flowers, and the yellow heads of *Sternbergia lutea angustifolia* make a gay and colourful show.

## WILD PLANTS

In woods and fields there are few flowers, and trees are bare. It is at this time of year that the things usually overlooked are noticed: the shape of trees and the tracery of branches against the sky, the mosaic patterns of bark, the colour of twigs, and the shape of buds. Fungi grow in the woods, chiefly on dead wood. Several mosses send up fruiting stems and are often mistaken for flowers.

## SHRUBS AND TREES

The white flowers of the cider gum tree *Eucalyptus gunnii* are conspicuous. *Prunus subhirtella autumnalis* is still in bloom, and *Chimonanthus praecox* has fragrant yellow and purple flowers. Two rhododendrons are flowering now, the evergreen *Rhododendron* Lee's Scarlet, and the deciduous *R. mucronulatum*, which has large purple blooms. A wide variety of evergreen foliage is available for Christmas decoration.

## BERRIES

Holly berries are characteristic of this season, but there are others just as colourful, including those of *pyracantha* and *Berberis hookeri*. Several varieties of cotoneaster and *crataegus* still have berries.

## BIRDS

Many birds come to the bird-table and water bowl. Starlings and house sparrows crowd out the other birds, and even rooks and jackdaws will sneak up if no one is within sight. When it is very cold, the local robin will accept others from adjoining territories without serious threat; male blackbirds seem to spend more time chasing one another than feeding; and tits, though gregarious, do not always agree when feeding close together. Song thrushes and hedge sparrows, on the other hand, slip in quietly and unobtrusively to snatch the scraps of food.

The nuthatch, great tit and skylark will be heard singing before the end of the year.

## INSECTS

Dancing swarms of winter gnats appear on damp, still days, and even on cold days providing there is no wind.

## ANIMALS

Although many mammals hibernate during the winter, others remain quite active, though little is seen of them.

In really cold weather, the stoat may change the colour of its coat and become white, except for the tip of its tail. The mountain hare, found chiefly in northern parts of the British Isles, also turns white in winter. The otter loves cold weather, even snow, and though it usually produces its young in the spring, some may be born as early as December.

# The Garden During Summer Holidays

CAREFUL planning can overcome most of the difficulties presented by leaving a garden untended during the growing and harvesting seasons.

## TWO WEEKS BEFORE LEAVING

1. Clip the hedges. If they are left untouched they will grow too thick for quick attention on return from holiday.
2. Complete any summer pruning of fruit-trees and shrubs, as they can produce a considerable amount of unnecessary growth in two or three weeks during the summer.
3. Clear all finished crops, such as lettuce, radishes or early peas. Proper planning at sowing time will have prevented a glut during the holiday period. Pick all fruit that is ready and preserve it by making jam, bottling or deep freezing.
4. Tie in all new growth on wall plants, on roses growing on posts, and on tomatoes. A storm can do considerable damage to summer growth that has been left hanging loose.

## ONE WEEK BEFORE LEAVING

5. Deal with any pests or diseases. If they are left even for a week or two during warm weather, they may develop beyond control.
6. Remove all weeds, especially those which are likely to flower or seed during the holiday. Frequent use of the hoe in borders and along the rows of the

vegetable garden is the quickest way to cope with this problem.

7. Mow the lawn very closely as late in the week as possible, and trim the edges.
8. Remove any small runner bean and french bean pods, and mulch along the rows of peas and beans with the lawn clippings to conserve moisture against dry weather.
9. Cut off all flower heads and any buds which are likely to blossom during the holiday. If they are left, the flowers will be in a faded condition at the end of the holiday. New buds will form very soon.
10. Remove from the greenhouse such plants as primulas, pelargoniums, chrysanthemums and begonias, and plunge the pots in soil in a shady part of the garden where they will require much less water.
11. Fumigate the greenhouse with smoke pellets as a safeguard against the spread of an attack by greenfly or white fly.
12. Make arrangements with a friend or neighbour to keep an eye on the plants in the greenhouse.
13. For advice on the care of house plants during holidays see *House Plants*.

## LAST MINUTE

14. Open fully the top and side ventilators in the greenhouse, as a fresh, buoyant atmosphere will discourage pests and diseases, and help to prevent the temperature from soaring during full sunshine.

# Latin Names and their Meanings

**L**ATIN is the language universally used for the naming of plants. In early times, it was the only language commonly understood by educated people, and it has continued as the medium for botanical nomenclature.

Plants, like people, have a family name (the generic) and a personal name (the specific). The history of the naming of plants is dealt with more fully in *Today's Garden*.

## GENERIC NAMES

The generic names of plants may be classified as commemorative, descriptive, foreign and miscellaneous.

They are always spelt with a capital initial.

### COMMEMORATIVE GENERIC NAMES

The practice of naming plants after people began in classical times and the following all date from before the Christian era:

*Achillea*: Achilles, famous warrior, slain by an arrow in his heel

*Artemisia*: the goddess Artemis

*Centaurea*: Chiron the centaur

*Daphne*: daughter of Peneus, pursued by Apollo

*Gentiana*: Gentius, King of Illyria from 180 to 167 B.C.

*Helenium*: Helen of Troy

*Hyacinthus*: the youth accidentally slain by Apollo

*Iris*: the goddess of the rainbow

*Paeonia*: Paeon, physician and god of healing

This precedent was followed by later botanists, and there are many classical or pseudo-classical names the use of which dates only from the 18th or 19th centuries:

*Amaryllis*: a countrywoman, in the works of Virgil

*Andromeda*: daughter of Cepheus, rescued by Perseus

*Cassiope*: mother of Andromeda

*Hebe*: daughter of Jupiter and wife of Hercules

*Nerine*: a sea nymph, daughter of Nereus

*Pieris*: Pierides, a name for the Muses

*Pleione*: the mother of the Pleiades

*Tagetes*: an Etruscan deity

A great many generic names commemorate botanists of many nations and their friends or patrons. These were often posthumous honours, and the botanist may have had no connection with the plant family that bears his name:

*Alstroemeria*: Baron Clas Alstroemer, 1736-1794, agriculturist, Swedish

*Aubrieta*: Claude Aubriet, 1668-1743, botanical artist, French

*Begonia*: Michel Begon, 1638-1710, patron of botany, French

*Buddleia*: Adam Buddle, 1660-1715, cleric and botanist, English

*Camellia*: Georg Josef Kamel ("Camellus") 1661-1706, missionary and botanist, Austrian

*Clarkia*: William Clark, 1770-1838, explorer, American

*Dahlia*: Andreas Dahl, 1751-1789, botanist, Swedish



*Escallonia*: Antonio José Escallón y Flores  
 fl.c. 1745-1780, botanist, Spanish  
*Eschscholzia*: Johann Friedrich Esch-  
 scholz, 1793-1831, botanist, Prussian  
*Forsythia*: William Forsyth, 1737-1804,  
 royal gardener, Scottish  
*Fuchsia*: Leonhardt Fuchs, 1501-1566,  
 physician and botanist, Bavarian  
*Godetia*: C. H. Godet, 1797-1879, botanist,  
 Swiss  
*Gunnera*: J. E. Gunnerus, 1718-1773, bishop  
 and botanist, Norwegian  
*Kalmia*: Petr Kalm, 1715-1779, botanist,  
 Finnish  
*Kniphofia*: Johann Hieronymus Knip-  
 hof, 1704-1763, botanist, German  
*Lapageria*: Empress Josephine (née de la  
 Pagerie), 1763-1814, patron of botany,  
 French  
*Lobelia*: Matthias de l'Obel, 1538-1616,  
 physician and botanist, Dutch  
*Lonicera*: Adam Lonicer, 1528-1586, botan-  
 ist, German  
*Magnolia*: Pierre Magnol, 1638-1715, phy-  
 sician and botanist, French  
*Mahonia*: Bernard McMahon, 1775-1816,  
 botanist and nurseryman, Irish-  
 American  
*Matthiola*: Pierandrea Matthioli, 1500-  
 1577, physician and botanist, Italian  
*Monarda*: Nicolas Monardes, 1493-1588,  
 physician and botanist, Spanish  
*Nicotiana*: Jean Nicot, 1530-1600, traveller,  
 French  
*Puschkinia*: Count Apollon Apollonovich  
 Mussin-Puschkin, d. 1805, chemist  
 and collector, Russian  
*Robinia*: Jean Robin, c. 1550-1629, royal  
 gardener, French  
*Romneya*: T. Romney-Robinson, 1792-  
 1882, astronomer, Irish  
*Rudbeckia*: Olaf Rudbeck, 1660-1740,  
 botanist, Swedish  
*Saintpaulia*: Baron Walter von Saint  
 Paul-Illaire, 1860-1910, traveller,  
 German

*Tradescantia*: John Tradescant, d. 1638,  
 royal gardener, English  
*Wisteria*: Caspar Wistar, 1761-1818, scien-  
 tist, American  
*Zinnia*: Johann Gottfried Zinn, 1727-  
 1759, botanist, German

# DESCRIPTIVE GENERIC NAMES

The majority of the names in this class  
 are of Greek or Latin origin, and most of  
 the latter are in fact latinized forms of  
 older Greek terms.

Greek words frequently employed in  
 the construction of generic names are:

*akanthos*: a thorn  
*anthos*: a flower  
*carpos*: a fruit  
*chamae*: dwarf, on the ground  
*chion*: snow  
*chloros*: green  
*chrysos*: golden  
*codon*: a bell  
*dendron*: a tree  
*helios*: the sun  
*kallos*: beauty  
*kokkos*: a berry  
*leucos*: white  
*-opsis*: resemblance, likeness  
*osma*: smell  
*phyllon*: a leaf  
*poly-*: many  
*rhodon*: a rose  
*schizo*: to cut or split  
*stachys*: a spike

Some descriptive names are a mixture  
 of Latin and Greek, as in *cotoneaster*:  
 from the Greek *cotone*, a quince, and an  
 abbreviation of the Latin *ad instar*, mean-  
 ing similarity or resemblance.

Some descriptive names were already  
 in use in classical times:

*Anemone*: wind-flower  
*Cyclamen*: a circle  
*Delphinium*: a dolphin  
*Fritillaria*: a dice-box  
*Gladiolus*: a little sword  
*Origanum*: joy of the mountain

## LATIN NAMES AND THEIR MEANINGS

*Petasites*: type of broad-brimmed hat

*Rosmarinus*: sea dew

Descriptive names devised by later botanists are very numerous, though sometimes less poetical:

*Antirrhinum*: *anti*, like; *rhin* snout, referring to the seed-vessel

*Aster*: *aster*, a star

*Calceolaria*: *calceolus*, a slipper

*Calendula*: *calendae*, the first of every month, referring to its continual flowering

*Callistephus*: *callistos*, most beautiful; *stephos*, crown, referring to the seed

*Campanula*: diminutive of *campana*, a bell

*Chionodoxa*: *chion* snow; *dexa*, glory (glory of the snow)

*Chrysanthemum*: *chrysos*, golden; *anthemon*, a flower

*Coreopsis*: *koris*, a bug; *opsis*, resemblance, referring to the seed

*Cosmos*: *kosmos*, beautiful

*Digitalis*: *digitus*, a finger

*Eranthis*: *er*, spring; *anthos*, flower

*Galanthus*: *gala*, milk; *anthos*, flower

*Geranium*: *geranos*, a crane (crane's bill, referring to the seed vessel)

*Helianthus*: *helios*, sun; *anthos*, flower

*Hemerocallis*: *hemera*, day; *kallos*, beauty, (day-lily)

*Hydrangea*: *hydor*, water; *aggeion*, a vessel, referring to the seed-vessel

*Meconopsis*: *mekon*, a poppy; *opsis*, similarity

*Mimulus*: *mimo*, an ape, referring to the shape of the combined petals

*Muscari*: *moschus*, musk, referring to the scent of some species

*Narcissus*: *narkai*, to grow stiff (the plant is credited with narcotic properties)

*Nigella*: *niger*, black, referring to the seeds

*Parthenocissus*: *parthenos*, a virgin; *kissos*, ivy (virginia creeper)

*Pelargonium*: *pelargos*, a stork (stork's bill, referring to the seed-vessel)

*Penstemon*: *pente*, five; *stemon*, stamens

*Physalis*: *physis*, a bladder

*Polygonatum*: *poly*, many; *gonu*, knee-joints, referring to the roots

*Primula*: diminutive of *primus*, the first

*Pyracantha*: *pyr*, fire; *akanthos*, a thorn

*Sedum*: *sedo*, I sit, referring to the plant's habit of growth

*Senecio*: *senex*, old man, because the seedheads look like white hair

*Symphoricarpos*: *symphoreo*, to bear together; *carpos*, fruit (which grows in clusters)

*Tigridia*: *tigris*, tiger

*Tropaeolum*: *tropaion*, a trophy, referring to the resemblance of flower and leaf to a helmet and shield, the ancient symbol of victory

### FOREIGN GENERIC NAMES

Many generic names are derived from foreign languages other than Greek or Latin, often from the plant's name in its native country:

*Alchemilla*: Arabic

*Amelanchier*: French

*Aucuba*: Japanese

*Babiana*: Dutch

*Berberis*: Arabic

*Camassia*: N. American Indian

*Cichorium*: Egyptian

*Crocus*: Chaldean

*Genista*: Celtic

*Ginkgo*: Chinese

*Hoheria*: Maori

*Hyssopus*: Hebrew

*Jasminum*: Persian

*Petunia*: Brazilian

*Skimmia*: Japanese

*Trollius*: German

*Tulipa*: Turkish

*Yucca*: Caribbean

### MISCELLANEOUS GENERIC NAMES

There are a few geographic generic names, including:

*Aconitum*: a hill in Pontica, Asia Minor

*Arabis*: Arabia

*Colchicum*: Colchis, ancient Black Sea

region, south of the Caucasus  
*Dictamnus*: Mt. Dicte in Crete  
*Iberis*: Iberia (Spain)  
*Tamarix*: the River Tamar in Spain

A few names indicate the plant's habitat:

*Convallaria*: of the valleys  
*Gypsophila*: a lover of chalk  
*Limnanthes*: from *limne*, a marsh  
*Limonium*: from *leimon*, a meadow  
*Nemophila*: a lover of the grove  
*Saxifraga*: of the rocks

Other names indicate the plant's uses:

*Anchusa*: *anchousa*, a paint used for the skin  
*Calluna*: *kallunein*, to sweep  
*Lavandula*: *lavare*, to wash  
*Lychnis*: *lychnos*, lamp, because its leaves were used for wicks  
*Reseda*: *resedo*, to calm or soothe; was once used for bruises  
*Salvia*: *salveo*, I heal  
*Saponaria*: *sapo*, soap  
*Scabiosa*: *scabies*, scabies, for which it was a cure  
*Syringa*: *syrinx*, a pipe, because the wood was so used in Turkey

### SPECIFIC NAMES

Specific names usually agree with the generic name in gender, where this is known, and for convenience, all examples given here are masculine gender. Specific names can be classified as historic, geographic, commemorative and descriptive. They are now always spelt with a small initial letter.

#### HISTORIC SPECIFIC NAMES

Many ancient and obsolete generic names have been retained as specific names, to preserve the historical continuity. Thus *Amellus* becomes *Aster amellus*. Other examples include:

*Abrotanum*: *Artemisia abrotanum*  
*Caprifolium*: *Lonicera caprifolium*  
*Cyanus*: *Centaurea cyanus*  
*Parthenium*: *Chrysanthemum parthenium*

*Parmica*: *Achillea ptarmica*  
*Sclarea*: *Salvia sclarea*  
*Thapsus*: *Verbascum thapsus*  
*Vitalba*: *Clematis vitalba*  
*Xiphium*: *Iris xiphium*

#### GEOGRAPHIC SPECIFIC NAMES

These are numerous, but not always reliable. Botanists erred or were misinformed about the places of origin of the plants they named; for example, many plants introduced from Japan proved later to be natives of China. The famous Swedish botanist Linnaeus, following classical precedent, regarded *indica* (Indian) and *sinensis* (Chinese) as being virtually interchangeable.

The meaning of many geographical names is self-evident, such as *europaeus*, *americanus*; but some, derived from ancient place-names, are less easy to identify. (Masculine terminations are *-us*, *-icus*, *-ensis*.)

*atlanticus*: the Atlas mountains  
*cambricus*: Cambria (Wales)  
*cantabricus*: Cantabria (north-western Spain)  
*capensis*: the Cape of Good Hope  
*chalcidonicus*: Chalcedon, part of Asia Minor  
*damascenus*: Damascus  
*gallicus*: Gaul (France)  
*hispanicus*: Hispania (Spain)  
*ibericus*: Iberia (Spain and Portugal)  
*lusitanicus*: Portugal  
*neapolitanus*: Naples  
*nipponicus*: Nippon (Japan)  
*novae-angliae*: New England  
*novi-belgii*: New Belgium, the name sometimes applied to the New Netherlands, now New York  
*ponticus*: Pontica, ancient region on the southern coast of the Black Sea  
*ruthenicus*: Ruthenia, in the Carpathians  
*tingitanus*: Tingi, now Tangiers

N.B. *formosa* and *florida* are descriptive, not geographic names, being feminine



forms of *formosus*, charming, and *floridus*, flowery.

Some geographic names are local:

- cantabrigensis*: of Cambridge
- edinensis*: of Edinburgh
- exoniensis*: of Exeter
- kewensis*: of Kew

others are general:

- australis*: of the south
- borealis*: of the north
- occidentalis*: of the west
- orientalis*: of the east

yet others indicate the plant's habitat:

- alpestris*: of the lower Alps
- alpinus*: of the high Alps
- campestris*: of the plains
- lacustris*: of the lake
- littoralis*: of the shore
- maritimus*: of the sea
- muralis*: of the walls
- palustris*: of the marshes
- pratensis*: of the meadows
- rivularis*: of the rivers
- saxatilis*: of the rocks
- segetus*: of the cornfields
- silvestris*: of the woods
- tectorum*: of the roofs

#### COMMEMORATIVE SPECIFIC NAMES

The persons honoured in this way usually had a direct connection with the plant.

(Terminations *-i*, *-ii*, *-ianus*, or in the case of a lady, *-ae*; the same name often occurs in both *-ii* and *-ianus* forms, and for convenience, only the commoner termination *-ii* is given here. All these names were formerly spelt with an initial capital.)

- allionii*: Carlo Allioni, 1705-1804, botanist, Italian
- baileyi*: F. M. Bailey, 1827-1915, soldier, traveller and naturalist, English
- clusii*: Charles de l'Ecluse, 1526-1609, botanist, French
- coulteri*: Thomas Coulter, 1793-1843, physician and botanist, Irish

- darwinii*: Charles Darwin, 1809-1882, scientist, English
- delavayi*: Jean Marie Delavay, 1834-1895, missionary and botanist, French
- douglasii*: David Douglas, 1798-1834, collector, Scottish
- farrerii*: Reginald J. Farrer, 1880-1920, author and collector, English
- fortunei*: Robert Fortune, 1812-1880, collector, Scottish
- henryi*: Augustine Henry, 1857-1930, botanist, Irish
- kaempferi*: Engelbert Kaempfer, 1651-1716, physician and botanist, German
- mariesii*: Charles Maries, c. 1850-1902, collector, English
- mussinii*: Count Apollon Apollosovich Mussin-Puschkin, d. 1805, chemist and collector, Russian (see also *Puschkinia* under Commemorative Generic Names)
- pallasii*: Peter Simon Pallas, 1741-1811, explorer and naturalist, German
- sieboldii*: Philipp Franz von Siebold, 1796-1866, physician and botanist, German
- thunbergii*: Carl Pehr Thunberg, 1743-1822, botanist and traveller, Swedish
- veitchii*: members of the English nursery firm of Veitch, flourishing 1808-1914
- vilmorinii*: members of the French nursery firm of de Vilmorin, flourishing since the mid-19th century
- wardii*: Francis Kingdon-Ward, 1885-1958, collector, English
- willmottiae*: Ellen Anne Willmott, 1860-1934, gardener, English
- wilsonii*: Ernest Henry Wilson, 1876-1931, collector and botanist, English

#### DESCRIPTIVE SPECIFIC NAMES

This is the largest class, and only relatively few examples can be given here. They are almost exclusively of Latin origin.

- acaulis*: stemless
- amoenus*: pleasing

*arborescens*: tree-like  
*barbatus*: bearded  
*bracteatus*: having bracts  
*caespitosus*: tufted  
*cordatus*: heart-shaped  
*coronatus*: crowned  
*denticulatus*: finely-toothed  
*eximius*: choice, rare  
*farinosus*: floury, mealy  
*floribundus*: free-flowering  
*fruticosus*: shrubby  
*glaber*: smooth  
*glaucus*: blue-green  
*gracilis*: slender  
*grandiflorus*: large-flowered  
*hirsutus*: hairy  
*hortensis*: of gardens  
*hybridus*: hybrid  
*incanus*: grey, hoary  
*insignis*: noticeable  
*integrifolius*: with entire leaves  
*lacinatus*: slashed or jagged  
*latifolius*: broad-leaved  
*marginatus*: edged, bordered  
*mollis*: soft  
*moschatus*: musk-scented  
*mutabilis*: changeable  
*nudicaulis*: naked-stemmed  
*odoratus*: scented  
*paniculatus*: flowers in panicles  
*plicatus*: folded  
*procumbens*: trailing  
*racemosus*: flowers in racemes  
*reticulatus*: netted  
*salicifolius*: willow-leaved  
*scandens*: climbing  
*sepiarius*: of hedges  
*speciosus*: showy  
*spinous*: thorny  
*striatus*: veined, striped  
*stylosus*: having prominent styles  
*suaveolens*: sweet-smelling  
*tomentosus*: felt-like  
*variabilis*: variable  
*versicolor*: of changing colour  
*villosus*: softly hairy  
*virgatus*: twiggy, wand-like

Many descriptive names refer to the colour of the flower:

*albus*: white  
*atrosanguineus*: deep red  
*aureus*: golden  
*azureus*: sky-blue  
*coeruleus*: blue  
*candidus*: white  
*carneus*: flesh-coloured  
*citrimus*: lemon  
*coccineus*: crimson  
*cruentus*: blood-red  
*ferrugineus*: rusty  
*flavus*: yellow, flaxen  
*fulvus*: tawny  
*luteus*: yellow  
*niger*: black  
*phoeniceus*: Tyrian purple  
*purpureus*: purple  
*roseus*: pink  
*ruber*: red  
*testaceus*: tile-coloured (terracotta)  
*viridis*: green

Some names indicate the plant's season or duration:

*vernus*: of spring  
*aestivalis*: of summer  
*autumnalis*: of autumn  
*hiemalis*: of winter  
*praecox*: early  
*serotinus*: late  
*majalis*: of May  
*nivalis*: of the snows  
*annuus*: annual  
*biennis*: biennial  
*perennis*: perennial  
*trimestris*: every three months

others refer to its uses or properties:

*coriarius*: of curriers or tanners  
*edulis, esculentus*: edible  
*officinalis*: of the (apothecaries) shops  
*scoparius*: of brooms or brushes  
*somniferus*: sleep-inducing  
*tinctorius*: for dyeing  
*utilis*: useful  
*venenatus*: poisonous

## GLOSSARY

- Axil:** The angle between the leaf stalk and the stem.
- Axillary:** Arising in the axil.
- Ball:** The mass of soil and roots of a potted plant.
- Bleeding:** The excretion of sap, usually as a result of late pruning.
- Blind:** A condition in which a plant has no growing point. Frequent in seedlings of brassicas. Hence to *go blind*.
- Bloom:** A powdery, waxy substance found on some fruits and leaves, especially those of plants that like dry conditions.
- Bolt:** When a vegetable plant flowers rather than makes a good heart, it is said to bolt. A common condition in lettuces during hot, dry periods.
- Bract:** A modified leaf, usually small, often green, at the base of a flower stalk or behind a flower head.
- Brassica:** The generic name for the cabbage family.
- Break:** A branch or fork, resulting from disbudding or injury.
- Bulbil:** A very small or secondary bulb that forms on such plants as *Lilium tigrinum*.
- Catch crop:** A quick-growing crop, grown on ground prepared for another purpose and harvested without interfering with the growth of the main crop.
- Clamp:** A frost-proof structure made from straw and soil for storing root crops in the winter.
- Crocks:** Pieces of broken flowerpot used to provide drainage in pots and boxes.
- Crook stage:** (see Loop stage)
- Cultivar:** A cultivated variety.
- Cutting:** A portion of stem, leaf or root which has been removed from a plant and prepared for independent growth.
- Dibber:** A wooden tool used for making holes. A slender dibber is used for seedlings and a thicker one for other plants. Hence to *dibble* in seedlings.
- Dicotyledon:** A plant bearing two seed leaves.
- Epiphyte:** A plant that grows above ground on other plants and derives nourishment from the air. Hence *epiphytic orchids*.
- Farina:** A white flour-like substance that covers stems and leaves of some plants, such as primulas.
- Fastigate:** Erect and tapering in habit. A term used to describe the form of such trees as the Lombardy poplar.
- Floret:** A floweret, one of the individual flowers which make up the head of a composite flower, such as a dahlia.
- Friable:** A term used to indicate a good loose condition of soil; easily broken up and workable.
- Fron:** The whole leaf of a fern.
- Glaucous:** Covered with a bloom, bluish-grey.
- Haulm:** The name given to the stem of some plants, such as peas, beans and potatoes, after harvesting.
- Incurved:** Petals or florets curving inward, as in some chrysanthemums.
- Inflorescence:** A group or arrangement of flowers on a stalk, sometimes forming a flower head.
- Internode:** The portion of stem between two nodes.
- Kind:** Genus; plants that vary botanically from one another.
- Lateral:** Side shoot.
- Leader:** The main shoot.
- Loop stage:** An early stage of growth in seedlings of the onion family, when the growing tip is still held by the seed coat. Also called crook stage.
- Maiden:** A plant in its first year after grafting or budding.
- Monocotyledon:** A plant bearing one seed leaf.
- Moraine:** An accumulation of debris formed by glacial action. Used in rock-gardening to describe a bed of similar construction.



- Mulch:** A top dressing put on the soil round plants to conserve moisture.
- Naturalize:** To grow plants under near-natural conditions so that they can maintain themselves.
- Node:** The point at which a leaf grows from a stem.
- Open weather:** Periods in winter that are free from frost, snow or rain.
- Panicle:** A type of inflorescence in which there are several forked branches, each with the youngest flowers at the top; for instance, lilac.
- Parterre:** A level space occupied by flower beds ornamentally arranged.
- pH:** A symbol used in conjunction with numbers to denote degrees of alkalinity or acidity.
- Picotee:** A dianthus with light petals edged with a darker colour.
- Pleach:** To interlace; the weaving of branches to form a screen.
- Pollard:** A tree that has been severely lopped so that the head consists of new wood; common practice with willows.
- Pot-bound:** A plant that has completely filled its pot with roots is said to be pot-bound. When turned out of the pot, only roots are visible.
- Puddle:** To dip plant roots into a mixture of soil and water just before planting.
- Raceme:** A type of inflorescence in which the individual flowers grow all round the main stem, and are attached to it by a small stalk, as in the hyacinth. The lower flowers open first.
- Recurved:** Petals or florets curving outward or backward.
- Rhizome:** An underground or surface running stem that resembles a root but produces true roots and shoots.
- Scion:** A bud or shoot removed from the parent plant for budding or grafting on to another plant.
- Sepals:** The green outer parts of a flower, collectively forming the calyx.
- Set:** A name given at planting time to some bulbs and tubers such as onions, shallots and potatoes.
- (to) Set:** Fruit blossom that has been fertilized and started to form miniature fruitlets is said to have set.
- Slip:** A cutting prepared by pulling a side shoot away from the main stem, so that a piece of the stem comes away at the same time.
- Spadix:** A column-like spike of male and female flowers usually surrounded by a spathe, as in the arum lily.
- Spathe:** The large bract surrounding the spadix in such plants as the arum lily.
- Spit:** One spade's depth of soil, usually ten inches.
- Spore:** The minute "seed" of ferns, mosses and fungi.
- Sport:** A shoot that differs (usually in flower colour) from the parent plant. Common in chrysanthemums.
- Sp.:** Species (plural: sps.).
- Square-area rainer:** A device on an iron stand fitted to the end of a hose. Water passes through a "rainfan" which moves slowly backward and forward covering a square area with artificial rain.
- Station sowing:** The practice of sowing seeds at the distance apart at which the plants are to grow.
- Stigma:** The sticky top of the style which receives the pollen grains.
- Stolon:** A shoot running along the surface of the soil and rooting at intervals. Strawberry runners are an example.
- Stool:** A plant used only for propagation. A term commonly applied to chrysanthemum plants that are kept through the winter to produce cuttings.
- Strike:** To give to a cutting conditions of cultivation conducive to root production. Once the roots have formed, the cutting is said to have "struck".
- Style:** The stem of the female part of the flower that connects the stigma to the ovary.
- Thong:** A piece of root used as a root cutting for propagation.
- Tilth:** The texture of the soil: a fine tilth resembles dry crumbs.
- Top fruit:** Apples, pears and stone fruit.
- Truss:** A loose bunch of fruit or flowers as in tomatoes and rhododendrons.
- Tubericle:** A small tuber-like growth.
- Type plant:** The original species.
- Variety:** A variation of the species of any plant.

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## INDEX

VOLUME 1 : 1 to 448

VOLUME 2 : 449 to 872

VOLUME 3 : 873 to 1264

Numerals in bold type indicate  
the main reference to the subject concerned

Numerals enclosed by brackets  
indicate illustrations

## A

- Acacia*, scale on 401  
false (494), (502), 524  
*Acaena* 280, 565  
*Acantholimon* 283, 293, 294  
*Acanthus* 182, 220, (561), 572, 1100  
*Acer* 28, (504), 505, 531, 564, 577, 1104, 1107  
*Achillea* 183, (194), 280, **283**, 293, 295, (417),  
570, 576  
*Aconitum* 184, (195), 217, 220, **480**, 1100  
*Acorns*, growing 1080  
*Acorn* (466), 472  
*Actinidia* 577  
Adder 1169, (1169)  
Adder's tongue (1082)  
*Adiantum* (581), **583**, **586**, 677  
*Adonis* 148  
*Adromischus* 619  
*Aechmea rhodocyanea* 633, **642**, 664, 665  
*Aeonium* 619  
*Aethionema* **283**, 293, 294, 295, 1109  
African daisy 149  
African hemp 967  
African marigold 167  
African violet 659, *see also Saintpaulia*  
*Agapanthus* 184, (195), 217, 1107  
*Agave* 619  
*Ageratum* 148, (155), 266, 1112  
Aggregate, for ring culture 902  
*Aglanema* **642**, 664, (675), 676  
*Agropyron repens* (416)  
*Agrostemma* 148  
*Agrostis* 590  
Air layering 134, (135)  
*Aira* 590  
*Ajuga* 184, 217, 220, 280, **480**, 562, 565, 578, 1100  
*Akebia* 541  
*Alchemilla* 572, 1100  
Alexandrian laurel 1103  
Algae 468  
*Alisma* 473  
Alkanet 149, 185  
Alkathene 1115  
*Allosurus*, *see Cryptogramma*  
*Allium* 280, 315, 866  
Almonds 809, (810), 1090  
diseases 371  
flowering 523  
pruning 489, 491  
varieties 809  
*Aloe* 620, (620), (631)  
*variegata* 620  
*Alopecurus* 593  
Alpine toadflax 288  
Alpines 279-295  
for sink gardens 1109  
history 20  
Alpines — continued  
in moraines 302  
late-flowering 294  
propagation 281  
suggested plants **283**, (284-292)  
*Althaea* 185  
Aluminium plant 658  
*Alyssum* 148, (154), 266, 281, 283, 293, 1080, 1112  
*Amaranth* 148  
*Amaranthus* 148  
*Amaryllis*, seed sowing 122  
*Amelanchier* 499, 505, 530, 531, 1104  
American blueberry (528), 529  
American gooseberry mildew 352, (358)  
American pondweed 479  
American swamp lily 476  
Amitrole 415  
Amphibia, *see* Frogs, Newts, Toads  
*Anacharis* 479  
*Anagallis* 148, 480  
Anapal 711  
*Anaphalis* 185, 563, 576  
*Anchusa* 149, 185, (194), 220, 481, 572  
propagation 128  
*Androsace* **283**, (284), 293, 294, 295, 1081, 1109  
*Anemone* **284**, 315, (316), 1100  
types and varieties 315  
*Angelica* 572, (859), (863), **865**  
Angiosperma 47, (48)  
Animals in the garden 1159-1193, 1194  
Anise (859), **865**  
Annelida 1182  
Annual chrysanthemum 152  
Annual meadow grass (412)  
Annual scabious 167  
Annuals 144-168  
autumn-sown 145  
border (146)  
diseases 145  
dwarf, for interplanting with roses 266  
exhibiting 1069  
for children's gardens 1076, 1078  
greenhouse sowing 146  
grey mould on 353  
half-hardy 145, 1078  
propagation 914  
propagation 118  
recommended plants 148  
under cloches 892  
*Antennaria* 284, 293  
*Antennaria* 185, 220, 284, 576, 866  
*Antlericum* 186, 217, 220, 1100  
*Antholyza* 186  
*Anthriscus cecifolium* 866  
*Anthurium* **642**, 664, 665, (667)  
*Antirrhinum* 149, (154), 1112  
diseases (362), 365, 371  
pests 404  
Ants **381**, (382), 641, 1187, (1187)  
*Apera* 590, (591)

- Aphelandra squarrosa louisae* 642, (644)  
 Aphids 247, 380, 381, 385, (386), 391, (391), (394),  
 (395), 397, (398), 401, 404,  
 468, 786, 1185  
   as carriers of diseases 349  
   black 986  
   control of 392  
   derris liquid for 169  
*Aponogeton* 463, 473  
*Aporocactus* 620  
 Apple and blackberry jam 834  
 Apple and elderberry jelly 839  
 Apple and plum butter 840  
 Apple and tomato chutney 844  
 Apples 691  
   bud development (710)  
   bush trees, delayed open centre (698), 699  
   open centre 699, (706)  
   buying trees 353, 692  
   cordon trees 491, 699, (700), (701)  
   deep-freezing 856  
   diseases (350), (351), 352, 353, 364, 365, 709  
   dwarf pyramid (693)  
   espallier (693), 704, (704)  
   exhibiting 1062, (1063)  
   family trees 697, 703  
   ginger 833  
   goblet-trained tree (680)  
   half-standard (692), 697  
   jelly 837  
   l'arcure training 702, (703)  
   pests 391, 392, 393, (394), 396, 397, 709  
   pillar trees (693), 701, (702)  
   pruning 705  
   seeds 70  
   spindle bush 703, (705)  
   standard trees 697  
   training 697  
   varieties (690), 712, (712), (713), (714), (716), (717)  
   wine 828  
 Applemint 868  
 Apricots 718  
   chutney 845  
   curd 840  
   jam 834  
   pruning 491, 720  
   tree shapes (719)  
   varieties (718), 720, (720)  
 Aquarium, glass 1081  
 Aquatics, ornamental 472  
   planting 467  
   submerged 479  
*Aquilegia* 186, (198), 220, 1100  
*Arabis* 1112  
   cutting back 281  
 Arachnida 1182  
*Aralia* 643, 664, 666  
*Araucaria* 505  
*Araucaria araucana*, history 21  
 Arbor-vitae (493), (502), 528, 559  
 Arborex 489  
*Arbutus* 499, (501), (503), 505, 530  
 Archangel, variegated yellow 1106  
 Archways 1144  
*Arctostaphylos* 149  
*Arenaria* 284, 295, 1109  
*Arisarum* 1078  
*Aristolochia* 542, (542), (569), 572, 1103  
*Armeria* 186, 217, 284, 293, 295, 1081, 1109  
*Armillaria mellea* 368  
*Arrhenatherum* 579, 593  
 Arrow arum 475  
 Arrow-head 476, 1082, (1083)  
 Arrowhead ivy 652  
*Artemisia* 186, 217, 505, 550, (550), 560, (562),  
 571, 576, 863, 865, 871  
   *abrotanum* 17, 505  
 Arthropoda 1182  
 Artichokes 980  
   globe 577, 980, (982)  
   Jerusalem 981, (982)  
   varieties 981, 982  
 Arum lily 478  
*Arunca* 187, 217, 220, 480, 1100  
*Arundinaria* 480, 567, 571 (574), 590, 1101, 1104  
*Arundo* 590, 593  
*Asclepias* 481  
 Ash, seeds of 70  
*Asparagus* 976, 983, (984)  
   beetle 984, (1186)  
   diseases 376  
   general care 984  
   varieties 984  
   weed control 420, 424, 983  
*Asparagus peas* 1043  
*Asperula* 1100  
*Asplenium* 587, 677  
*Aster* 118, 187, (194), 1087, 1100  
   alpine 284  
   diseases (366), 371  
   mildew on 188  
   pests 404, 405  
   verticillium wilt on 188  
*Astilbe* 189, (195), 220, 481, 565, 1100  
*Astrantia* 189, 481  
*Astroloba* 620, (620)  
*Astrophytum* (620), 621  
*Athyrium* 583  
*Atriplex* 566, 571, 576  
 Aubergines, *see* Egg-plants  
*Aubrieta* 284, 293, 1112  
   cutting back 281  
   seed 282  
*Aucuba* 499, 505, 530, 531, 550, 560, 571, 1101  
*Auricula* 1112  
 Autumn crocus 316  
*Avena* (590), 591  
 Avens 204  
 Avocado pears 677, 1085  
 Azaleas, *see also* Rhododendrons



## Azaleas — continued

- history 20, 21, 22, 24  
 varieties (532), (537), 538  
*Azolla* 478

## B

## Baby blue eyes 164

## Bachelor's buttons 518

## Bacteria 1197

## action on compost 111

*Bacterium tumefaciens* 365

## Badminton court (609)

## Balloon bellflower 289

*Ballota* 561, (562), 576

## Balm 860, (860), 865, 1113

## Balsam 147, 160, 1078

## tree 1091

## Bamboo 480, 499, 501, 590, 1101

## dwarf 567, 1104

## Banded rose sawfly 409

## Banks, Sir Joseph 34

## Banksian rose 546

## Barberry 506

## Bark, fibre, crushed 1097

## formation of 54

## nicking 490

## ringing 708

## slitting, on apple trees 709, 778

## Barrel cactus 623

## Basic slag 102

## for roses 264

## Basil (864), 865

## Bastard trenching 94

## Bats 1161, (1161)

## Bay (864), 865

## Beans 985

## broad 985

## diseases (374)

## general care 986

## seed 118, 119

## varieties 986

## care before holidays 1217

## diseases 349, (374), 376

## dwarf or french 987, (988)

## for intercropping 1000

## varieties 989

## exhibiting 1067

## flageolet 990

## varieties 990

## haricot 990

## varieties 990

## Beans — continued

## in children's gardens 1077

## pests 384, 385, (386), 388, 404

## runner 990

## varieties 993

## salting 853

## weed control 420

## Bear's breeches 182

Beds, *see also* Borders

## island 177, (187), (190), (193)

## marking out 1120, (1120), (1121)

## raised (1099), (1138)

## Bee balm 130

Beech 552, *see also* *Fagus*

## copper 552, 565, (568)

## hedge 489, 560

## trees, propagation 132

## Bees 1187, (1187), (1188)

## Beetles (391), 396, (403), 404, (407), (1185), 1186, (1186)

## Beetroots 993, (994)

## bleeding 994

## diseases (374)

## seed 119

## varieties 994

## wine 829

*Begonia* 118, 149, 643, 665, 676, 906, 967, 1101, 1107, 1112, 1115, 1217

## diseases 371

## fibrous-rooted 906

## growing temperatures 906

## pests 400, 401, 408

## pricking out 123

## propagation 127

## seed 118

## shading for 906

## tuberous-rooted 906, (908)

## propagation 131

*Begonia rex* 127, (644), 664, (667)

## leaf cutting (126)

## Bell flower 170, 190

## Bell-glasses 125

*Bellis perennis* 1101, 1112

## Bent grass 590

*Berberidopsis* 542*Berberis* 499, (505), 506, (506), 530, 531, 550, 565, 1100, 1101

## Bergamot 209, 484, 859, (859), 865, (867), 1113

*Bergenia* 189, 217, 572, 1100, 1104

## Berries, poisonous 1200

*Betonica* 190

## Betony 190

*Betula* (492), (502), 507

## Bible, plants mentioned in 1088–1093

## Biennials 169–173

## for children's gardens 1076

## propagation 118

## recommended plants 170

## "Big bud" mite (390), 392

## Bilberries 804, (804)

- Billbergia nutans* 676  
 Bindweed 153, 181, 415, (416), 421  
 Birch 507  
   seeds 70  
   silver (492), (502), 507  
 Bird's nest philodendron 658  
 Birds, in the garden (1158), 1170, (1170), (1173-1177), (1179), (1180)  
   bath for 1097  
   identification 1171  
   law concerning 1195  
   nest boxes for (1171)  
   scarers for 1041, (1041)  
 Bishop bug (402)  
 Bishop's cap 621  
 Black currants 725, 1063  
   cuttings 726, (727)  
   diseases 368, 369  
   feeding 725  
   gall mite 392  
   jam 834  
   jelly 839  
   reversion 393  
   syrup 854  
   varieties (725), 727  
   weed control 415  
   wine 829  
 Black velvet 658  
 Blackberries 721, 1063  
   adventitious roots 53  
   crown gall 365  
   cultivation 723  
   disease spores on 723  
   diseases (358), 365  
   harvesting 724  
   layering 133  
   leaf-bud cuttings (126)  
   ornamental 525  
   propagation 132, 723, (723)  
   varieties (721), 724, (724)  
   wine 829  
 Blackberry and apple jam 834  
 Blackbirds 1171, (1176)  
 Black-eyed Susan 167  
 Blackfly 385, 986  
 Bladder campion (418)  
 Bladder senna 510  
 Blaikie, Thomas 20  
 Blanket flower 157, 201  
 Blanket weed 173  
 Blanket weeds 469  
 Blechnum 587  
 Bleeding heart 197  
 Blight 360, (366), 372, 373, 377, (378), 935  
 Blind seedlings of brassica plants 975  
 Blind worm 1169, (1169)  
 Blinds 886, (886)  
 Blue cedar (492), (502), 509  
 Blue colorado spruce 566  
 Blue Indian orchid 922  
 Blue poppy, *see* *Meconopsis*  
 Bluebells 947, 1101  
   pests 408  
 Blueberry (528), 529, 808, (808)  
   propagation 808  
 Blue-eyed Mary 289  
 Bocconia, *see* *Macleaya*  
 Bog arum 473  
 Bog bean 474  
 Bog gardens 462  
   grass for 593  
   plants for 462, 480  
 Bog pimpernel 480  
 Bone, manure 104  
   meal 103, 104  
 Bonfires, law relating to 1195  
 Borage 858, (859), (860), 866, 1113  
 Borders, *see also* Beds  
   annual 145, (146)  
   chrysanthemums for 224  
   foliage for 563  
   herbaceous 174, (178), (182)  
   marking out 1120  
   mixed 177  
   narrow 176  
   perennial 174  
 Borecole, *see* Kale  
 Botanic Gardens 32  
   Cambridge 32  
   Edinburgh 32  
   Kew 34  
   Liverpool 34  
   Northern Horticultural Society's 34  
   Oxford 32  
   Royal Horticultural Society's 34  
 Botrytis cinerea 356, 364  
 Bottle gardens 674, (674), (675), (676)  
   plants for 676  
 Bottling 846  
   equipment 846  
   fruit 846  
   vegetables 846, 849  
 Boundary fences 1140  
 Bouquet garni 864  
 Bowling greens 609, 613  
 Bowls for indoor plants 679  
 Bowstring hemp 659  
 Box 551, 560, 578, 589, 861, 1107  
 Boysenberry 807  
 Bracken (423)  
   dried, in flower arrangement 961  
 Brambles, control of 415, 421  
 Branching larkspur 156  
 Brass buttons 473  
 Breaking 349, 372, 373  
 Bridges 1151, (1151-1154)  
 Briza 591, (591)  
 Broccoli 996  
   curdling 996  
   general care 997

## Broccoli, curding — continued

- harvesting 997
- varieties 997, (998)
- diseases (374)
- sprouting 997
- general care 998
- varieties 998
- Brome grass 591
- Brompton stocks 172
- Bromus* (590), 591
- Bronze-leaf 484
- Broom, *see also* *Cytisus*
  - dispersal of seed 75
  - pruning 488
- Brown scale (390), 397, 409
- Brown-rot fungus 734
- Brunnera* 481, 572
- Brussels sprouts 999, (999)
  - intercropping 1000
  - pests 385
  - varieties (969), 1001
- Bryophyllum* 621, 626
- Bud or eye cuttings 127
- Bud-cuttings from woody stem (127)
- Budding 136, (137), (138)
- Buddleia* 22, 491, 499, (506), 507, 1101, 1103
- Buffalo currant 524
- Bugbane 193, 481
- Bugle 184, 480
- Bugloss, Siberian 481
- Bulbs 305–320
  - and corms 305, (306)
  - for miniature gardens 673
  - forcing 667, 919
  - growing on water 670
  - in children's gardens 1083
  - in town gardens 1101
  - in window boxes 1111
  - planting 305, (307), (308), (309), (310), (313)
  - weeds 420
- Bulky manures, use of 87
- Bullace wine 829
- Bullaces, *see* Plums
- Bulrush 476
- Buphthalmum* 481
- Bupleurum* 571
- Burning bush 160, 197, 1078
- Burro's tail 630
- Bush fruit 725, 742, 790
  - unusual 808
- Bush roses, *see* Roses
- Busy Lizzie 160
- Butomus* (466), (472), 473
- Buttercup 67, 415, 599, (602)
  - creeping 411, (417), 786
  - grass-leaved 290
- Butterflies and moths 385, (386), 1189, (1190–1193)
  - pollination by 71
- Butterfly bush 507
- Buxus* 551, 560, 578, 1101

## C

- Cabbages 1001, (1003)
  - buying plants 353
  - coleworts 1005
  - diseases 353, (374), 376
  - pests 384, 385, (386), 388, 389
  - red 1005, (1005)
  - varieties 1005
- Savoy 1006
  - varieties 1006
- spring 1001, (1002)
  - varieties 1002
- summer and autumn 1002
  - varieties 1004
- weed control 420, 424
- winter (1003), 1004, (1005)
  - varieties 1004
- Cacti and succulents 614–631
  - areoles 615
  - diseases 619
  - epiphytic 615
  - for living-room 616
  - pests 618
- Calandrinia umbellata* 1081
- Calathea louisae* 643, 665
- Calceolaria* 118, 149, 1112, 1115
  - botrytis on 364
- Calendar, nature 1201–1216
  - of work 425–447
- Calendula* 149, 1101, 1112
- Calico bush 518
- Californian poppy 156, 1076
- Californian redwood 566
- Californian tree poppy 567
- Calla* 473
- Callistephus* 150
- Calluna* 507, (507), 530
- Callus 128
- Calomel dust 373, 374, 376
- Caltha* 66, 473, (473)
- Camassia* 315, 481
- Canellia* 507, (508), 571, 944, 1101, 1103, 1107
  - diseases 371
  - history 21, 22
  - pest 401
  - propagation 127
  - pruning 488, 499
  - seed 119
  - soil 16
- Campanula* 170, 190, 217, 220, 280, 285, (285), 293, 295, 1081, 1100, 1109, 1112, 1115
- Campanelle 312
- Campion 161, 208
- Campsis* 542, 1103
- Canary creeper 168
- Canary Island ivy 652
- Canary ivy 652



- Candle plant 631  
 Candytuft 160, 266, 376, 1078, 1106  
 Cane fruit 721, 749, 786  
   unusual 807  
 Canna 1112  
 Canning fruit and vegetables 851  
 Canterbury bell 170  
 Cape gooseberry 130  
*Capsella bursapastoris* (413)  
 Capsid bugs 247, 393, 397, 404  
 Capran 350, 351, 354, 359, 367, 371, 373, 377  
*Caralluma* 621  
 Caraway (859), 866  
 Carbohydrates 62, 65  
 Carbon dioxide in leaf 62  
*Cardamine* (480), 481  
 Cardoons 561, 577, 1007  
   varieties 1008  
 Carnations 929-941  
   annual 156  
   border 929, (929), 930, (930)  
     layering of 133, 932, (933)  
     pests 935  
     picotee 930  
     propagation 133, (931), 932  
     varieties (929), 935, (935)  
     weeds 932  
   buying 929  
   calyxes splitting 932, 1069, (1070)  
   Chabaud or marguerite 156, 929  
   diseases 362, (362), 364, 371, 932, 935  
   exhibiting 1069, (1070)  
   perpetual-flowering 929, (930), 936, (941)  
     disbudding (939), 940  
     pests 400, (403)  
     propagation (937), 938  
     stopping (940)  
     varieties (934), (935), 941  
   pipings (127), 128  
 Carpeting plant, silver 577  
*Carpinus* 551, 560  
 Carrion flower 631  
 Carrots 1008  
   early 1008  
   exhibiting 1064, 1065, (1065)  
   general care 1009  
   in children's gardens 1085  
   pests 384, 385, (386), 389, 1009  
   seed-saving 70  
   seeds 119  
   sowing seed 120, 1008  
   varieties 1010, (1010)  
   weed control 420, 424  
   wine 829  
 Cart-wheel plant 653  
*Carum carvi* 866  
*Caryopteris* 491, 499, 508, 530  
*Cassinia* 564, 567  
 Castor meal 86  
 Castor oil plant 167, 643, 1101  
 Cat's ear (602)  
*Catalpa* 508, 530  
   ***hignonioides*** (500), (503), 508, 1104  
*Catananche* 192, (199), 220  
 Catch crops 972  
   on celery ridges 1014  
   spinach 1053  
 Caterpillars 385, 393, 405  
 Catherine-wheel plant 661  
 Catkins 551  
 Catmint 1107  
 Caucasian whortleberry 529  
 Cauliflowers 1011, (1012)  
   "blindness" 1012  
   exhibiting 1065  
   pests 385  
   varieties 1013  
   winter 996  
*Ceanothus* 491, 499, 542, 551, 560, 1101, 1103  
   pests 409  
 Cedar 508, *see also Cedrus*  
   of Lebanon 18  
   pencil 557  
   western red 1143  
*Cedrus* (492), (502), 508, 566  
 Celeriac 1013  
   varieties 1014  
 Celery 1014  
   diseases (374), 1015  
   earthing up 1016, (1016)  
   exhibiting 1017, 1065, (1065)  
   general care 1015  
   pests 384, 389  
   seed 119, 1015  
   self-blanching 1017  
   varieties 1017  
   wine 829  
 Celery fly 385, (386)  
*Celostia* 147, 152, 1112  
*Centaurea* 152, (154), 192, (198), 217, 220, 1078,  
   1079, 1112  
 Centaury 192  
 Centipedes 1183, (1183)  
*Centranthus* 192, 217, 220, 1100  
*Cephalaria* 192  
*Cephalocereus* 621  
*Cerastium tomentosum* 280  
*Cercis* (494), (502), 509, 530  
*Cereus* 621  
*Ceropegia* 621  
*Chaenomeles* 491, 530, 543, 961, 1101, 1103, 1107  
 Chafer grubs 381, (382)  
 Chalky ground 34, 887  
   plants for 220, 530  
*Chamaecereus* (621), 622  
*Chamaecyparis* (495), (502), 509, 556, (558), 560,  
   (562), 566, 567, 1107  
 Chameleon plant 646  
 Chamomile (859), 866, (867)  
   lawn 860, 866

- Chapeau de Napoleon 525  
 Cheal's weeping cherry 1079  
*Cheiranthus* 170, (170), 285, 293, 294  
*Chelone* 192, (199), 217, 220, 1100  
*Chenopodium album* (413)  
 Cherries 729  
   black, conserve 836  
   butter 840  
   diseases (351)  
   fan-shaped trees (681), 730  
   pruning and training 733, (733), 739  
   flowering forms 523  
     history 24  
     pests 404, 405  
     pruning 489, 491  
   jam 834  
   shapes of trees (734)  
   sour 491, 738  
     diseases 369  
     varieties 740  
   sweet 491, 729  
     planting 730, (730), (731)  
     types of tree 729  
     varieties (728), 735, (736)  
   wine 829  
 Cherry pie 157  
 Chervil 859, (859), 866, (868)  
 Chickweed (412), 599, (602)  
   control of 420, 602  
 Chicons 1018  
 Chicory (418), 1018  
   varieties 1018  
 Children's gardens 1074-1087  
 Chilean glory flower 545  
 Chilean potash nitrate 102  
 Chilean potato tree 547  
 Chimney bell flower 170  
*Chimonanthus* 491, 543, 1103  
 China aster 152, 1112  
 China, plants from 16, 34  
 Chinese forget-me-not 172  
 Chinese honeysuckle 555  
 Chinese lantern 130  
 Chinese lily 326  
 Chinese peony 209  
 Chinese pink 156  
*Chionodoxa* 316, 1083, 1112  
 Chives (860), 866, 1113  
   pests 388  
 Chlorophyll 54, 57  
*Chlorophytum capense variegatum* 643, (645), 665, 666  
*Choisya* 499, (509), 510, 530, 531, 551, 560, 571  
 Christmas cactus 631  
*Chrysanthemum segetum* (423)  
*Chrysanthemums* 193, 217, 221-237, 961, 1100, 1112  
   annual 152  
   border 222, (230), (231), (233)  
   as foliage plants 576  
*Chrysanthemums*, border — continued  
   diseases (362), 364  
   incurved 230, (230)  
   incurving (230), 231  
   pests 222, 223, 228, 383, (402), 404, 405, 408  
   planting 224  
   pompons 233, (233)  
   propagation 222  
   reflexed 231, (231)  
   single 233, (233)  
   stopping 228  
   tying (225)  
 exhibiting 1070, (1070)  
 greenhouse 234  
   American sprays 237  
   anemone-flowered 236  
   care before holidays 1217  
   December flowering 237  
   decorative 221, (235), 236  
   incurves 236  
   large exhibition 235, (235)  
   November flowering 235  
   pests (402), 408  
   pompons 236  
   singles 236  
   stopping 235  
   history 21, 22  
 Chutneys 844  
*Cichorium intybus* (418)  
 Cigar plant 153  
*Cimicifuga* 193, 481  
*Cineraria* 118, (904), 906, 1113  
   pests 405, 408  
   varieties 907  
 Cinquefoil 213  
   shrubby 522  
*Cissus antarctica* 645, 665  
*Cistus* 498, 499, (508), 510, 530, 531  
 Citrus fruits from pips 677, (677)  
 Citrus, scale on 401  
*Cladosporium fulvum* 353  
*Clarkia* 144, 152, 1078  
   diseases 364  
   history 21  
 Clamp (1009), 1010, 1046, (1046)  
 Clary 167  
*Cleistocactus* 622  
*Clematis* 491, 530, 543, (543), 1100, 1103, 1113  
   alpina 285, 491  
   history 24  
   powdery mildew on 365  
   propagation (116), 133  
   seeds 70  
 Cleome 153  
*Clerodendrum* 499, 501, 510  
 Click beetles 384  
 Climate, humidity of 65  
   in evolution of the garden 16  
   in relation to pests 380  
 Climbers and wall plants 539-547

## Climbers and wall plants—continued

- suggested plants 541  
 supports for (540), 541  
 Cloches 891, (892), 1059  
   construction 893  
   crops for 892  
   five-strip system (891), 892  
 Clock golf, lawn for 613, (613)  
 Cloud grass 590  
 Cloud plant 157  
 Clover (417), 602, (602), 778  
   mecoprop for 411  
 Club-root disease 353, 374, 376, 389, 975, 1023,  
   1025, 1055  
   host plants of 352  
 Cobnuts and filberts 491, 810, (811)  
   for hedges 551  
   varieties 812  
 Cobweb houseleek 291  
*Cochlioda* 927  
 Cockchafer beetles (403), 404, 1186, (1186)  
 Cockscorn 152  
 Cocksfoot grass 593  
 Cocoa palm 645  
*Cocos weddelliana* 645, 664  
*Codiaeum* 645, (648), 664, 665, (667)  
*Codonopsis* 285  
 Coffee fern 588  
*Coix* 591  
 Colchicine, mutation by 25  
*Colchicum* 25, 316, (317)  
   seeds 70  
 Cold frame 122, 899  
*Coleus* 63, 1101, 1112, 1115  
   pests 400  
 Coleworts or collards 1005  
 Collinson, Peter 20  
 Colorado spruce 566  
 Columbine 186, (341)  
*Columnea oerstediana* 646, 665  
*Colutea* 500, 510, 530, 531  
 Comfrey (859), (864), 866  
 Common briar 265  
 Common flax 161  
 Common fumitory (413)  
 Common Green Capsid (390), 393, 404  
 Common horsetail (419)  
 Common houseleek 291  
 Common juniper (501), 557, (559)  
 Common laburnum 518  
 Common laurel 523, 1102  
 Common meadowsweet 482  
 Common Mussel stock 720, 773  
 Common polypody (1082)  
 Common privet 555  
 Common red poppy (422)  
 Common speedwell (416)  
 Common spindle tree 513  
 Common spruce 558  
 Common sunflower 157

- Common turkscap 329  
 Compost 111  
   box 112, (115)  
   making 111  
   micro-organisms in 112  
   sterilization 121  
   use of 113  
 Compton, Henry 20  
 Cone flower 167, 214  
 Conifers, for hedging 556, 560  
   diseases 365  
   dwarf 672  
   pruning 489, 491  
*Conophytum* (621), 622, 628  
 Conserves 836  
 Construction in the garden 1116-1157  
*Convallaria majalis* 28, 1104  
*Convolvulus* (150), 153, 576, 983, 1076, 1112  
   *arvensis* (416)  
 Copper beech 552, 565, (568)  
 Coral flower 205  
 Coral plant 542  
*Coreopsis* 153, 196  
 Coriander 866  
*Coriandrum sativum* 866  
 Corkscrew rush 474  
 Corms, buying 353  
   construction 305, (306)  
   development 334, (335)  
   diseases 348, 353  
 Corn cockle 148  
 Corn marigold (423)  
 Corn salad 1019  
   varieties 1019  
 Corn spurrey (423)  
 Cornelian cherry 510  
 Cornflower 146, 152, (342), 1078  
 Cornish heath 513  
*Cornus* 491, 500, 501, 510, (575), 578, 1101  
*Coronilla* 564, 566, (574)  
*Cortaderia* 592  
*Corylus* 551, 560, 565  
*Corynebacterium fascians* 365  
*Coryphantha* 622  
 Cos lettuce, see Lettuce  
 Cosmea 153  
*Cosmos* 146, 153, (155)  
*Cotoneaster* 500, (509), 510, (511), 530, 531,  
   544, 552, 560, 564, 578, 1101, 1103, 1104  
   alpine 285  
   pests 409  
   seed 119  
 Cotton thistle 564, 577  
*Cotula* 280, 473  
*Cotyledon* 622  
 Cotyledon 48, 123  
 Couch grass (416)  
 Cowslip (342)  
   wine 829  
 Coys, William 32



- Crab apples 17, 520, 806  
 in flower arrangement 944, 958  
 pests 404, 405  
 seed 119  
 spiced 844  
 varieties 806
- Crambe* 196
- Cranberries 803  
 varieties 803
- Crane fly 383, 603, (1188), 1189
- Cranesbill 201
- Crassula* (614), 622, (622)  
 leaf-cuttings 618  
 time of flowering 619
- Crataegus* 511, (512), 530, 552, 560, 1104
- Crazy paving, *see* Construction
- Creeping buttercup (417)
- Creeping fig 650
- Creeping Jenny 570, 1112
- Creosote 496
- Cress 1034, 1076, 1085
- Cress hog 1085, (1086)
- Crested moss 525
- Crested newt, male (1167)
- Cresylic acid 353, 356, 400
- Crevice plants 294
- Crimson dwarf 565
- Crimson-leaved vine 561
- Crinkled metal plant 656
- Crinum* 196
- Crocasmia* 196, (199)
- Crocuses 306, 669, (669), 671, (671), 1083, 1101, 1112  
 history 24  
 propagation 131  
 varieties 306, (307)
- Cronartium ribicola* 368
- Crop rotation of vegetables 970, (970), (971)
- Croquet lawn 609, (611)
- Cross-leaved heath 513
- Croton* 645, (648), (667)
- Crown gall 365
- Crown imperial 955
- Crows (1174), 1175
- Cruciferae* 75
- Crustacea 1182
- Cryptanthus* 646, 664, (675), 676
- Cryptogramma* (580), 583
- Cryptograms 47
- Cuckoo flower 481
- Cucumber leaf sunflower 157
- Cucumbers, diseases 349, 365, 376  
 pests 400  
 pickles 842  
 ridge 1019  
 varieties (1020), 1021  
 under glass 893, (895)  
 varieties 895, (896)
- Cultivar, description of 29
- Cuphea* 153
- Cupid's dart 192
- Cupressus* 511, 557, 560, 562, 567, 963
- Currant tomatoes 1077
- Curtis, William 36
- Curtoneus* 573
- Cushion Scale (398), 401
- Cut flowers, treatment of 967  
 wilting of 65  
 wire netting for 337, 953
- Cuttings, *see* Propagation
- Cutworms 381, (382), 388
- Cyclamen 118, 285, (285), 316, 907  
 diseases (363), 364, 365  
 hardy 316  
 history 24, (33)  
 pest 401  
 sowing seeds 907
- Cyclamen poppy 573
- Cymbidiums 922, 924, (924)  
 repotting 927  
 varieties 927
- Cynara* 561, 562, 577
- Cynoglossum* 153, 172, 196
- Cypress, false, *see also Chamaecyparis*  
 Lawson's 495, 556  
 Monterey 511, 557  
 Summer 160
- Cyripedium* (925), 928
- Cyrtomium* 586, 587
- Cytisus* 491, 500, 501, 511, (514), 530, 552, 560, 1087, 1103

## D

- Daboecia* 512, 530
- Dactylis* (589), 593
- Daddy-long-legs 383, 603
- Daffodils 267, 310, 1083, 1101, *see also Narcissus*  
 forcing 671, 919  
 pests 408  
 propagation 131
- Dahl, Dr. Andreas 239
- Dahlias 239-251, 1101, 1112  
 anemone-flowered (238), 240  
 cactus-flowered (238), 240, (250)  
 collarette (239), 240, (249)  
 decorative (238), 240, (248)  
 disbudbing 246, (247)  
 diseases 248, 353, 364, 365, 371  
 double show and fancy 240  
 dwarf bedding 241, (249)  
 propagation 241, (242), (243), (244)  
 exhibiting 1070, (1071)

- Dahlias** — continued  
 management 246  
 miscellaneous classes 241  
 orchid-flowered 241, (251)  
 peony-flowered (238), 240  
 pests 247, 404, 405  
 planting 245, (245)  
 pompon (238), 240, (250)  
 single-flowered (238), 239  
 star-flowered 240  
 varieties 248
- Daisies** (343), 602, (602), 1076, 1101  
 double, 122, 1101, 1112
- Daisy bush** 521
- Dalapon** 415
- Dame's violet** 172
- Damping down greenhouses** 888, 896
- Damping-off diseases** 88, 122, 353, (363), 364
- Damsel-fly** 1185
- Damson jam** 834  
 jelly 838  
 wine 829
- Damsons** 687, *see also* Plums
- Danae racemosa*** 1103
- Dandelions** 411, 415, (419), 599, (602)  
 seed dispersal 70  
 wine 829
- Daphne*** 500, 512, (512), 530, 578, 1101
- Date stone, a plant from** 1084
- Davallia*** 587, 677
- David, Father** 22
- Davidia*** 22, 24
- Davis, Peter** 24
- Day lily** (27), 205, 482
- Decodon*** 473
- Decorative plants, control of weeds** 420  
 greenhouse 903, (904)  
 pests 401
- Deep-freezing procedure** 856  
 peas for 1042
- Delavay, Father** 22
- Delphinium*** 67, 130, 153, (175), 196  
 diseases 348, (363), 365, 371  
 division 130, 197  
 mulching 196  
 propagation 130  
 staking 181, 196
- Dendrobium*** 922, (926), 928
- Dennstardtia*** 584
- Deodar** 509
- Derris** 247, 381–409
- Desert privet** 656
- Deutzia*** 513, 530, 1101  
 pruning 489, 491
- Devil-in-the-bush** 164
- Devil's ivy** 661
- Dianthus*** 156, 172, 197, 220, 285, (286), 293, 294, 295, (561), 567, 1081, 1109, 1112  
*curvophyllus* 929  
 mulching 197
- Dibber** 976, (976)
- Dicentra*** 197, (203), 217, 1100
- Dicotyledonous, root** (53)  
 stem (56)
- Dicotyledons** 47
- Dictamnus*** 197, 220
- Dieffenbachia*** 646, (649), 664
- Dieldrin** 381, 389, 405
- Diervilla** 529
- Digging, double** 94, (94), (95)  
 single 93, (93)
- Digitalis*** (171), 172, 197, 220, (423)
- Dill** (859), 866  
 water 866
- Dimorphotheca*** 156
- Dipladenia rosea*** 647, 665
- Disa*** 922
- Diseases of plants** 347–379  
 lists of 364  
 non-parasitic 347  
   correction 361  
 notifiable 361  
 of fruit 369  
 of trees and flowers 371  
 of vegetables 376  
 parasitic 347, 348  
   control 361  
   potato certification scheme 361  
   prevention and control 352  
     before holidays 1217  
   resistant plants 360
- Division of plants** 129
- Dock** 415, (417), 421, 983, 1200
- Dog rose as stock** 137
- Dog's tooth violet** 317
- Dogwood** 499, 510, 1101
- Dolichochele*** 623
- Donkey's ears** 577
- Doronicum*** 200, 220, 1100
- Dorset heath** 513
- Double digging** 94, (94), (95)
- Double flower** 24
- Douglas, David** 21
- Douglas fir** (496), (502), 523  
 history 21
- Draba*** 286, 293, 295, 1109
- Dracaena*** 647, (650), 664, 666, (675), 676
- Dracaena bromeliad*** 646
- Dragon tree, variegated** 647
- Dragon-fly** 1185, (1185)
- Drainage** 84, 98–100, (99), (100)  
 in pots and boxes 121
- Dried blood** 103
- Drill-making** 97, (97), 120, (973)
- Drosanthemum*** 623, 628
- Drought** 977
- Dryas*** 286, (286), 293, 294, 295
- Dryopteris*** (583), 584, 1106
- Dumb cane** 646
- Dutch elm disease** 371

Dutch hoe 96  
 Dutch honeysuckle 546  
 Dutch light frame 890, 914  
 Dutchman's breeches 197  
 Dutchman's pipe 542, *see also* *Aristolochia*  
 Dwarf beans, *see* Beans, dwarf  
 Dwarf tomatoes 1060

## E

Earth stars 646  
 Earthworms 1159, 1182  
 Earwigs 228, 247, 397, (402), 405, (1184), 1185  
 East Malling Research Station 687, 691, 786  
 Easter cactus 630  
*Eccremocarpus* 545, 1103  
*Echeveria* (614), 623  
   propagation 127, 618  
*Echinocactus* 623  
*Echinocereus* 623  
*Echinodorus* 474  
*Echinops* 200, 217, 220, 1100  
*Echinopsis* 624  
*Echium* 156  
 Eckford, Henry 273  
 Eclipse No-Soil compost 888  
 Edelweiss 288  
*Edraianthus* 286, 293, 295  
 Edelgrass 1082  
 Elms 228, (387), 388, 397, (399), 405, (407), 408  
 Egg plants 1021, (1022)  
   varieties 1022  
*Elchhornia* 478  
*Elaeagnus* 562, 578, 1101  
 Elder 525, 570, 578  
 Elderberry and apple jelly 839  
 Elderberry wine 829  
 Elderflower and gooseberry jelly 839  
 Elderflower wine 830  
 Elecampane 483  
 Electricity in the garden 913-919  
 Elephant ear 189, 1104  
 Elizabethan gardens 12  
 Elk's horn fern 588  
 Elm 556, 560, 570  
   disease, Dutch 371  
*Elymus* (590), 592  
 Emerald ripple 656  
 Endives 1022  
   varieties 1023  
 Endosperm in seeds 48  
 English yew (498), (503), 528  
*Eomecon chionanthum* 573

*Epidendrum* (926), 928  
*Epimedium* (569), 573, 1104  
*Epiphyllum* (623), 624  
*Epilsetum arvense* (419)  
*Eragrostis* 592  
*Eranthis* (316), 317  
*Erianthus* 592  
*Erica* 60, 491, 513, 530, 1113  
   in greenhouse (905), 907  
   propagation 130  
*Erigeron* 200, (203), 220  
   alpine 286, 293, 1109  
*Eriobotrya japonica* 1103  
*Erodium* 286, 293, 294, 295, 1109  
*Eryngium* 200, (202), 220, 567  
   propagation 128  
*Erysimum* 287, 293  
*Erythronium* 317, (317)  
*Escallonia* 491, 499, 513, 530  
*Eschscholzia* 156, (158), 1076  
*Eucalyptus* 566, (961), 963  
*Eucryphia* 500, 513, (515)  
*Euonymus* 513, (514), 530, 531, 567, 578, 1101, 1103, 1106  
   diseases 371  
*Eupatorium* 200, 220, 481  
*Euphorbia* 201, 217, 220, (562), 567, 571, 615, 624, (625), 1100  
   for foliage 564  
 Evening primrose 209, 1076  
 Evergreen hedges 560  
 Evergreens, for town gardens 1101  
   leaves 64  
   overhead spraying 498  
   pruning 489, 491, 494  
 Everlasting flower 157, 576  
 Everlasting pea 546  
 Exhibiting 1062-1073  
   flowers 1068  
   fruit 1062  
   vegetables 1064  
 Exotic brush 642  
 Extractor fans 917

## F

*Fagus* 552, 565, (568)  
 Fairchild, Thomas 36  
 Fairy floating moss 478  
 False acacia 524  
 False cypress, *see* *Chamaecyparis*  
 False goat's beard 481  
 False oat grass 593



- False spiraea 526  
 Fan plant 643  
 Fantasia ivy 652  
 Far East, plants from the 21  
 Farmyard manure 105  
 Fat hen (413)  
*Fatschedera* 571, (575), 578, 647, (651), 665, 666, 1101  
*Fatsia* 514, (519), 571, 1101  
*Fawcaria* (624), 625, 628  
 Fauna in mature gardens 1159  
 Feather grass 592  
 Feather leaf 642  
 Feeding plants 52  
*Felicia* 156  
 Fences 1140  
   law concerning 1196  
   plants for 256, 1103  
*Fenestraria* 625, 628  
 Fennel 565, 860, (860), 867  
 Fermentation, in jam 833  
   in wine 826  
 Ferns 581-588  
   greenhouse 585  
   cultivation 585  
   recommended plants 586  
   hardy 581  
   cultivation 582  
   recommended plants 583  
   in children's gardens 1081  
   in town gardens 1106  
*Ferocactus* 625  
 Fertilizers and manures 101-115  
 Fertilizers, application and uses of 101, 103, 104, 105, 106, 109  
   as top dressing 110  
   compound 107  
   analysis of 108  
   John Innes base 108  
   liquid feeds 108  
   National Growmore 108  
   fish 95, 103, 104  
   foliar feeding 109  
   general hints on using 109  
   inorganic 101, 110  
   nitrogenous 102  
   phosphatic 102  
   potassic 102  
   leaf mould 107  
   organic 103  
   organic manures, bulky 105  
   composting 106  
   composting farmyard manure 105  
   hop manures 106  
   peat 106  
   poultry 106  
   sawdust 107  
   seaweed 107  
   shoddy 107  
   storing 110  
*Ferula* 565  
*Festuca* 592  
*Ficus* (632), 640, 648, 649, 664, 665, 666, (675), (678)  
 Field poppy (422)  
 Figs 648, 797  
   creeping 650  
   pests 401  
   pruning 491, 799, (799)  
   varieties (797), 799, (800)  
 Figwort 570  
 Filberts 810  
*Filipendula* 201, (210), 220, 481, 570, 573  
 Finches (1180), 1181  
 Fines herbes 864  
 Finger plant 656  
 Fire thorn 546, 555, 560, 1102  
   stratification of seed 119  
 Fish 468, 1083  
*Fittonia argyrea* 651, 665, 676  
 Flageolet beans 990  
 Flaming dragon tree 647  
 Flaming sword 662  
 Flamingo flower 642  
 Flax 161, 208, 288  
 Flea beetles 169, (387), 388, 1004, 1012, 1049  
 Fleabane 200  
 Flies (1184), (1185), 1188, (1188), (1189)  
 Floating plants 478  
 Florida ribbon fern 588  
 Floss flower 148  
 Flower arrangement 942-967  
 Flower beds, island sites 177, (187), (190), (193)  
 Flower border, effect from June-Sept. (178)  
   improving existing one 178  
 Flowering almond 523  
 Flowering currant 489, 524, (524)  
 Flowering fern 584  
 Flowering hedges 560  
 Flowering peach 523  
 Flowering rush 473  
 Flowering shrubs and evergreens in town gardens 1101  
 Flowers, construction 67, (71)  
   contrasts in raised beds (1099)  
   crystallized 857  
   exhibiting 1068  
   families of 67  
   fertilization 67  
   function of 67  
   inflorescences 66, (68)  
   language of 340  
   natural order 67  
   pericarp 70, (73), (74)  
   receptacles 67  
 Fluorescent tubes 919  
*Foeniculum vulgare* 867  
 Foliage 561-579  
   recommended plants 564  
 Foliar feeding 109

- Foot rot disease 364  
 Forget-me-not 475, 1101, 1107, 1112  
   seed sowing 122  
 Forking 93  
 Formaldehyde 1015  
 Formalin 356, 357, 368, 378, 902  
*Forzythia* 22, 514, (550), 552, 1101, 1103, 1107  
   pruning 489, 491, 499  
 Fortune, Robert 21  
 Fothergill, Dr. 20  
 Foxgloves 172, 197, (423), 952  
 Foxtail grass 593  
 Fragrant hedges 560  
 Frames and cloches 889  
   cold 122, 124  
   disinfection 356  
   Dutch light 890, 914  
   English light 914  
   types 889  
 Frameworthing 141  
 Frazer, John 20  
*Freesia*, diseases 371  
   pest 410  
 French beans, *see* Beans, dwarf  
 French lavender 518  
 French lilac 192  
 French marigold 168  
 Fringed pink 156  
*Fritillaria* 317, 482, (482), 955  
 Fritillary 1101  
 Frogbit 479  
 Frogs 1166, (1166)  
 Frost pockets 16, 682  
 Fructose in leaves 62  
 Fruit 70, 681-822  
   buying trees and bushes 681  
   deficiency symptoms 683  
   diseases (358), (359), 369  
   exhibiting 1062, (1063), (1064)  
   frost damage (350), 682  
   protection 683  
   function 70  
   general care 683  
   harvesting 688  
   Min. of Agriculture Certification Scheme 681  
   pericarps (73)  
   pests of (390), 391, (391), (394), (398)  
   planting gardens for (686), (688)  
   planting, control of weeds 415, 682  
   preserving 832  
   propagation 136, 685  
   pruning 491  
   soft, protection against birds 682, (682), 709  
   stock 136  
   supports 682  
   syrups 854  
   unusual 797  
   wine-making 823  
*Fuchsia* 491, 499, 501, 514, 552, (553), 560, 577,  
   1101, 1107, 1112, 1115

- Fuchsia*—continued  
   history 19, (19)  
*Fumaria officinalis* (413)  
 Fumigation 353, 888  
 Fungi 66  
   in soil 87  
 Fungicides, smokes 356  
   dust 973  
   systemic 360  
 Fungus, soil-borne 973  
*Funkia* 206, 567  
*Furcraea sellos marginata* 651, 665  
 Furze, Paul 24  
 Furze 528

## G

- Gages, *see* Plums  
*Gaillardia* 157, 201, 220  
   propagation 128  
*Galanthus* 317, 963  
*Galax aphylla* 1106  
*Galega* 201, 220  
*Galetia* 201, 318, 1101  
 Ganwick frame 889  
 Garden balsam 160  
 Garden chafer 404  
 Garden, landscape, for children (1074), 1075  
 Garden pickle 841  
 Gardener's garters 593  
 Gardenia 945  
   diseases of 371  
 Gardening diary 425, 1087  
 Gardening, history of 29-45  
   indoor 667-669  
   today 37  
 Gardens, during holidays 1217  
   history 15  
 Garlic 29, 867, 1091  
*Garrya* 21, 545, 1103  
*Gasteria* 625, (625)  
 Gates for the garden (1148), 1149, (1150)  
*Gaultheria* 500, 515, 530, 531  
 Gay feather 207  
*Gazania* 1112  
 Generic names 26, 1218  
 Genetics 26  
*Genista* 491, 515, 531, (531)  
 Gentian, *see* *Gentiana*  
*Gentiana* 201, (202), 287, (287), 293, 294, 295  
 Genus, definition 28  
*Geranium* (116), 201, (203), 204, 287, 293, 294,  
   364, 566, 573, 579, (880), 908,  
   1087, 1100, 1107, 1112

- Gerard, John 17, 30  
 Germination 48, 119, 122  
   encouragement of 974  
*Geum* 204, 287  
 Giant reed 593  
 Giant scabious 153  
 Giant summer hyacinth 201  
 Giant yellow scabious 192  
*Gilia tricolor* 266  
*Ginkgo* 515, 530, 531, 571  
   *biloba* (497), (503)  
 Glacier ivy 652  
 Gladioli 332-339  
   bulblets 335  
   butterfly type 333  
   varieties (332), 338  
   *colvillei* 334  
   varieties 338, (339)  
   corms and cormlets 334, 335, (335)  
   diseases 336, 353, (363), 365, 372  
   early flowering 334, 338  
   exhibiting 334, 336, 1071, (1072)  
   face-ups 334  
   large flowered 333  
   varieties (332), 337  
   miniature 333  
   varieties 338, (339)  
   history 333  
   pests 336, (363), (403), 405, 408, 410  
   *primulinus* hybrids 333  
   varieties 338, (338)  
 Glass, in the garden 881-912  
   cloches 889  
   greenhouses 881  
   in garden construction 1143  
 Glaucous-leaved plants 566  
*Glecoma hederacea* 578  
*Gleditsia* (493), (502), 515, 1104  
 Globe flower 216, 484  
 Globe thistle 200  
*Globularia* 288, 293, 294  
*Glottiphyllum* 625, 628  
 Gloxinias 907, 919, 944  
   diseases 372  
   propagation 127  
   varieties 907  
 Glucose in leaf 62  
*Glyceria* 474, 579, (589), 593  
 Goat's beard 480  
 Goat's rue 201  
*Godetia* (151), 157  
   diseases 353, 364, 372  
   dwarf 266  
 Golden acacia 570  
 Golden elder 499, 525, 570  
 Golden feather 570  
 Golden heart ivy 653  
 Golden heather 567  
 Golden marjoram 579  
 Golden mint 563, 579  
 Golden moss 571  
 Golden privet 555, 1100  
 Golden rod 215  
   propagation 129  
 Golden-leaved plants 562, 567  
 Goldfish 468  
 Golf, lawns for practice 612  
 Gooseberries 491, 687, 742, (744), (745), (746)  
   diseases (358), 365, 369  
   jam 834  
   pests 384, (390), (391), 392, 393, 396, 397  
   types of bush 743  
   varieties (742), 747  
   weed control 415  
   wine 830  
 Gooseberry and elderflower jelly 839  
 Goosefoot 599  
 Gopher wood 1090  
 Gorse 528  
   dispersal of seed 70  
 Gourds 1077, (1077)  
 Grafting 136, 139, (139-143)  
 Granite chippings 1124  
 Grape hyacinth 319, 1083, 1101  
 Grape ivy 659  
 Grape jelly 838  
 Grape wine 830  
 Grapefruit tree 1084  
 Grapes, outdoor 815, *see also* Vines  
   under glass 895  
   diseases (351), 364, 365  
   exhibiting 1062, (1063)  
   varieties 898, (900)  
*Gratiopetalum* 625  
 Grass, killers 415  
   propagation for lawns 599  
 Grasses, ornamental 589-593  
   pollination 69  
   suggested plants 590  
   variegated 593  
 Grasshoppers 1089, 1184, (1184)  
 Green gage (785), *see also* Plums  
   jam 834  
 Green gold pepper 656  
 Green manuring 113  
 Green ripple ivy 651, 654  
 Greenfly 228, 380, 385, 468, 641, 935, 1004, 1185  
 Greenhouses 881  
   aluminium 884  
   care before holidays 1217  
   condensation in 885, 886  
   disinfecting 353  
   Dutch light 881, 882, (883)  
   fumigating 353, 888, 1217  
   heat insulation 885  
   heating 884, 915  
   hygiene 888  
   law, relating to 1197  
   lean-to 881, (883)  
   pests 397



- Greenhouses — continued  
 plants 893  
 propagating equipment 887  
 ring culture 902  
 shading 886, (886), 923  
 siting 882  
 soil sterilization 352, 400  
 soil-warmed borders 914  
 span-roofed 881  
 supplementary lighting 882  
 temperature 884, 917  
 three-quarter span 881, (883)  
 ventilating 885, 917  
 wooden 884
- Grevillea 122
- Grey bulb rot disease 357
- Grey mould fungus 364
- Ground cover 563  
 for town gardens 1104, 1106
- Groundsel (412), 599, 1170
- Growth-regulating substances 124, 487
- Grubs, chafer 381, (382)
- Guano 104
- Guelder rose 529
- Gulf stream, effect of 979
- Gulls (1170), 1172
- Gunnera* 482, 573
- Gymnocalyx* (624), 626
- Gymnosperms* 47, (48)
- Gypsophila* (151), 157, 204  
 alpine 288, 293, 294

## H

- Hair grass 590
- Halesia* 515
- Hamamelis* 491, 500, 515, (516), 531
- Hampton Court Gardens 30
- Handkerchief tree 22
- Hanging baskets 144, 910, 1114, (1114)  
 plants for 587, 588, 1115
- Hardening off 147
- Hardy perennials 174–220, 1071, 1100
- Hare's foot fern 587
- Hare's tail grass 592
- Harriot, Thomas 18
- Hartford fern 587
- Hart's tongue fern 584, 1106
- Harvestmen 1182, (1183)
- Hatfield House gardens 18, 32
- Haworthia* 626, (626)  
 leaf-cuttings of 618
- Hawthorn 511, 552, 560
- Hawthorn — continued  
 pests 405, 409  
 powdery mildew on 365  
 pruning 488  
 seed 119
- Hay-scented fern 584
- Hazel 118, 551, 560  
 nuts 70, 1090, *see also* Cob-nuts  
 pollination 69
- Heading back 140, (485)
- Heath 491, 513
- Heather 16, 20, 66
- Heating, electric 884, 913  
 oil 884
- Hebe* 516, 530, (561), 564, 566, 1101, 1113
- Hedera* 545, 966, 1103, 1106  
 as foliage plant 570, 572, 577, 579  
 adventitious roots 53  
 house plants 651, 652, (654), 664, 665, 666,  
 (667)
- Hedgehog holly 578
- Hedgehogs 1160, (1160)
- Hedges 548–560  
 as backdrop 1097  
 coniferous 556, 560  
 evergreen 560  
 flowering 560  
 fragrant 560  
 fruit 681  
 law concerning 1200  
 maintenance 489, 549, (549), 918  
 miniature 551  
 mixed 560  
 ownership of 1196  
 planting 548  
 plants for 533, 550  
 seaside 551, 556, 560  
 shelter 1118  
 town garden 1097
- Heeling-in plants 258, 493
- Helenium* 204, 220  
 pests 405  
 propagation (117), 129
- Helianthemum* 577, 1109  
 alpine 288, 293  
 cutting back 281
- Helianthus* 157, 205, 1079
- Helichrysum* 157, 280, 576
- Heliosylis* 205, 220
- Heliotrope* 157, 1101, 1107, 1112, 1115
- Heliotropium* 157
- Helipterum* 157
- Hellebore, in flower arrangement 947, 963  
 leaf spot (363)
- Helleborus* 573
- Hemerocallis* (27), 205, (211), 217, 220, 482, 1100
- Hemlock spruce 559, 560
- Hemp agrimony 481
- Henry, Augustine 22
- Heracleum mantegazzianum* 573

- Herb garden, border 550  
 chess-board (839)  
 paved 861  
 planning 860  
 position of 859  
 window-box 1113
- Herb of grace 567
- Herbaceous spiraeas 201
- Herbariums, origin of 29
- Herbs 858-871  
 history of 29  
 plants to grow 858  
 use of 863
- Hesperis* 172
- Heuchera* 205, (210), 217, 1100
- Heucherella* 206, 217, 1100
- Hibiscus* 491, 500, 516, 530
- Hieracium* 280, 577
- Hill, Thomas 30
- Himalayan honeysuckle 519
- Hippophae* 500, 516, (517)
- History of gardening 14-45
- Hoary plantain (419)
- Hoe, types of 96, 97, (97)  
 electric 918
- Holcus* (591), 593
- Holly 119, 488, 489, 1100, *see also* *Ilex*  
 leaf miner (403), 409  
 seed 119
- Holly fern 587
- Hollyhock 185  
 pests 405  
 propagation 128  
 rust disease 185, (366)
- Holm oak (497), (503), 524, 555
- Honesty 172, 579
- Honey fungus 368
- Honey locust (493), (502), 515
- Honeysuckle (343), 546, *see also* *Lonicera*  
 stems 55
- Hoof and horn meal 103, 112
- Hop manures 106, 465, 582, 1097
- Horehound 579
- Hormones 487
- Hornbeam 551, 560  
 pollination of 69
- Hornets 1089
- Horse chestnut 947  
 growing from seed 1080  
 history 17, 18  
 propagation 132
- Horsetail (419)
- Horticultural Society of London 21
- Hosta* 206, 482, 1100, 1106  
 as foliage plants 564, 567, 570, 573, 579
- Hoi-beds, electric 914
- Hottonia* 480
- Hound's tongue 153, 172
- House plants 633-666  
 choosing 634
- House plants—continued  
 classification 664  
 common names of 664  
 conditions for 634, 965  
 feeding 637  
 for cool room (678)  
 for warm room (667)  
 pests 641  
 popular plants 642  
 pruning and training 639  
 repotting (638), 639
- Houseleek 291, 615, 1081
- Houttuynia* 474
- Huckleberry 804
- Humea elegans* 961
- Humus 76, 85, 105, 1097
- Hyacinth 307, (308), 318, (668), (669), 1083, 1085, 1112  
 classification 664  
 forcing 671, 919  
 pests 408  
 varieties 308
- Hyacinth-flowered candytuft 160
- Hyacinthus* 318
- Hybrids 24, 25, 29, 75
- Hydrangea* 516, 530, 531, 947, 1101, 1103, 1107  
 blue 517  
 climbing 545, 572  
 diseases 372  
 for hedging 553, (553), 560  
 lace-cap varieties 517  
 pests 404  
 pruning 491, 499, 500, 501
- Hydrocharis* 479
- Hypericum* 130, 516, 517, 530, 531, 577, 1101, 1106, 1109  
 alpine 288, 293, 294  
 pruning 491, 499, 501
- Hyssop (859), 867, (868)  
 tea 867
- Hyssopus officinalis* 867

## I

- Iberis* (158), 160, 1078, 1100, 1106, 1109  
 alpine 288, 293
- Ice plant, variegated 567, 661
- Iceland poppy 173
- Ichneumon flies 1188
- Ilex* 531, 553, 560, 578, 1101
- Immortelle 157
- Impatiens* 147, 160, 1078
- Importing plants 361, 1198
- Incarvillea* (202), 206

Incense plant 961  
 Indian bean tree (300), (503), 508  
 Indian corn 593  
 Indian fig 628  
 Indian pink 156  
 Indigo 517  
*Indigofera* 499, 517  
 Indoor gardening 632, 667-679, 1080, (1082), (1083)  
 Inflorescences, examples of (68)  
 Insects **1182**  
     and pests, law concerning 1197  
     beneficial 380  
     specialized conditions for 1159  
 Inter-cropping vegetables 972  
*Inula* 206, 220, 483  
*Ionopsidium acaule* 1080  
*Iphæion* 320  
*Ipomoea* 160, 1075, 1113  
 Irises 206, (210), 308, (466), 474, 483, 567, 1100  
     alpine 288, 293, 295  
     bulbs (309)  
     diseases of 206, 372  
     Dutch 308, 309  
     English 308, 309  
     German 130, (130), (210)  
     history 18, 24, 26  
     lime for 206  
     pests 405, 408, 410  
     propagation 130, (130), 131  
     rhizomes of 35  
     Spanish 308, 309  
     species and varieties 309, (309)  
 Irish marbled ivy 652  
 Iron Cross begonia 643  
 Irrigation, electric pumps for 918  
     for vegetables 977  
     in the Bible 1091  
*Isatis tinctoria* 29  
 Island flower beds 177, (186), (190)  
 Ivy, *see also Hedera*  
     scale on 401  
 Ivy peperomia 656  
 Ivy tree 647  
 Ivy-leaved speedwell (412)  
*Isotria* 318

**J**

Jackdaw (1174), 1175  
 Jacob's ladder 212  
 Jam-making 832  
 Japan, plants from 16

Japanese maple 504, 505, 564, 1107, (1108)  
 Japanese pink 156  
 Japanese wineberries, *see* Wineberries  
*Japonica* 543, 961, 1101, *see also Chaenomeles*  
 Jasmine, *see Jasminum*  
     history 17, 22  
*Jasminum* 546, 578, 1103, 1113  
     pruning 491, 499, 500  
 Jelly-making 837  
     equipment for 833  
 Jerusalem sage 571, 1101  
 Jew's mallow 518  
 Jewel of the veldt 168  
 Job's tears 591  
 John Innes, base fertilizer 887  
     Institution 692  
     potting compost 887  
     seed compost 887  
 Jonquil 312  
 Joseph's coat 148, 645  
 Judas tree (494), (502), 509  
 Jumping jack 1078  
*Juncus* (422), 474  
 Juniper, *see also Juniperus*  
     diseases of 372  
*Juniperus* (501), (503), **518**, 557, (559), 560, (563), 570, 571, 1107  
*Jussieuia* 474

# K

Kaempfer 18  
*Kalanchoe* 626  
 Kale 1023  
     varieties 1024  
*Kalmia* 491, 501, 518, (519)  
 Kangaroo vine 645  
*Kentranthus*, *see Centranthus*  
*Kerria* 130, 499, **518**, 530, 531, 578, 1101, 1103  
 Kew Gardens 20, 22, 34  
 Kidney beans, *see* Beans, dwarf  
 King's acre berry 807  
 Kingcup 473  
 Kingdon-Ward, Frank 24  
 Kingfisher daisy 156  
*Kirengeshoma palmata* 573  
*Kleinia* 627  
 Knapweed 192  
 Knight, Thomas Andrew 26  
*Kniphofia* 207, 217  
 Knol kohlrabi, *see* Kohl rabi  
 Knotgrass (422)  
*Kochia* 160, 1078, 1112  
 Kohl rabi 1025



# L

## Labelling (120)

*Laburnum* (501), (503), 518, 530, 1104

diseases of 369, 372

Lace-wing flies 1185, (1185)

Lad's love 17, 505, 550, (550), 571

Lady fern 582, 583, 1106

Lady's amock 481, 572

Lady-in-the-bath 197

Ladybirds 1187, (1187)

*Laelia* 928

*Lagarosiphon* (478), 480

*Lagurus* 592

*Lamarckia* 592

Lamb's lettuce 1019

Lamb's tails 551

Lamb's tongue 577

*Lamium* 579, 1106

*Lampranthus* 627, 628

Land-development, law concerning 1197

Landscape garden for children 1075

Language of flowers 340-346

Larch, diseases 372

Larkspur 153

pests 410

Late Dutch honeysuckle 546

*Lathyrus* (23), 207, 217, 220, 546

Latin names, and their meanings 1218-1223

Laurel 532, 554, 555, 560, 947, 1102

newly planted 498

pruning 488

*Laurus* 518, 1101, 1107

*Laurustinus* (526), 529

*Lavandula* 500, 530, (554), *see also* Lavender

*Lavatera* 160, 207, 220, 1079

Lavender 491, 518, 554, 560, (859), 867, 1100, 1102

bags 867, 1086

water 867

Lavender cotton 525

Law for gardeners 1194-1200

Lawn tennis court (610)

Lawns 594-608, 609-613, 1096

fertilizers for 411, 594, 601, 605

fungus diseases 601, 603

levelling 594, 600, (600)

maintenance 599

moss 414, 603, 605

mowers 605, 918

mowing 599, 600, 604, 608, 1217

mowings, as mulch 786, 992, 1032

in compost 112

planning and preparation 594

recreational 609

earthworms in 609

maintenance of 609

watering 612

## Lawns—continued

renovation (604), 605

rolling, when established 600

before sowing 595

seed mixtures 595, 1096

soil 594

pests in 603

sowing 595, (597)

turfing 597, (598), (600), 609

vegetative propagation 599

weed control 411, 414, 595, 599, 601, 602, (602), 605

Lawson's cypress (495), (502), 509

Layering 132, (132), 133, (133)

air 134, (135)

Leaf, arrangement 57, (61)

mould 107

as mulch 97

shapes (58), 60, (502), (503)

Leaf beetles 1186

Leaf black spot 373

Leaf blotch (355), 371

Leaf spot disease 352, (358), (359), (363), (366), (367), (370), 371, 372, 374, (374)

Leaf-hoppers 349; 397, (398), 406, 408

Leaf-miners 397, (402), (403), 408, 476

Leaf-rolling insects 504

Leaf-weevils 404

Leafy gall (362), 365, 371

Leatherjackets 380, (382), 383, 603, 1189

Leaves, function 57, 109

Lee, James 19

Leeks 1025, (1027)

diseases of 376

exhibiting 1026, 1066, (1066)

general care 1027

history 29, 1091

pests 388

seed saving 75

varieties (968), (1026), 1028

*Lemaireocereus* 627

Lemon, plant grown from a pip (677), 1084

Lemon-scented verbena 519

*Leontopodium* 288, (288)

Leopard's bane 200

*Leptosyne* 160

Lettuces 1028, (1029), 1079

cos (1030), 1031

varieties 1031

diseases 349, 365, (375), 376

pests 384, 385, 392

seed saving 70

sowing 120, 1028, 1031

broadcast 120

in cold frame 122

summer cabbage 1028

varieties 1029

under cloches (891), 892

varieties for children's garden 1079

winter cabbage 1031

- Lettuces, winter cabbage — continued  
 varieties (1030), 1031
- Leucojum* 319
- Levelling in garden construction 594, (600),  
 1118, (1119)
- Lewisia* 288, 293, 294
- Ley, temporary 114
- Leycesteria formosa* 499, 519, 1102
- Liatris* 207
- Lighting, artificial 918
- day length manipulation 919
- for bulb forcing 919
- replacement 919
- supplementary 918
- Lights, installation of garden 1097
- Ligularia* 207, 220, 566
- Ligustrum* 554, 560, 562, 570, 1102
- Lilacs 527, 556, 1102
- diseases (366), 372
- pests (403), 409, 410
- pruning 131, 491, 501
- Lilies 321–331
- botrytis 325, 372
- bulbs 322, (322), (323)
- diseases 325, 372
- history 24
- hybrid 330
- in pots 323
- in town gardens 1101, 1107
- pests 324, 325, 410
- seed sowing 122
- species and varieties (321), (325), 326, (326),  
 (327), (328), (329), (331)
- stem-rooting 322, 323
- with roses 267
- Lily of Japan, golden-rayed 326
- Lily-of-the-valley 28, 57, 1104
- Lime 92, 1096
- Lime sulphur 369, 371, 390, 393
- Limnanthes douglasii* 21
- Linonum* 207, 220
- Linaria* 161, 1109
- alpina* 288, 293, 295
- vulgaris* (418)
- Ling 507
- Linnaeus 28
- Linné, Carl 28
- Linum* (159), 161, 208, 220, 288, 293, 1109
- Lippia* 519
- Liquid feeds 108
- application 109
- Lithops* (626), 627, 628
- Lithospermum* 289, 293, 294
- Little diamond ivy 652
- Little fantasy 656
- Livingstone daisy 164
- Lizard's tail 476
- Lizards (1168), 1169
- Lobb, Thomas 22
- Lobb, William 21
- Lobelia* 118, 161, 483, 566, 1112
- trailing 1115
- Lobelia* 627
- Locust tree (494), 502, 524
- Loganberries 749
- jam 835
- pests 396
- propagation 132, 133, 687, (750), 751, (751)
- training (750), 751
- varieties (748), 751
- London plane 25
- London pride 1113
- Lonicera* (539), 546, 549, 555, 570, 1076, 1100,  
 1103, 1113
- Loofah 1077
- Loosestrife 208, 483
- Lophophora* 627
- Loquat 1103
- Lovegrass 592
- Love-in-a-mist 164, 1078
- Love-lies-bleeding 148
- Lowberries 807, (807)
- Luffa* 1077
- Lunaria* (171), 172, 579
- Lungwort 213
- Lupins (175), 208, 1100
- annual 144
- as green manure 113
- division 130
- pests 410
- Lupinus* 500, 519
- Lutzi ivy 652
- Lychnis* 161, 208, (575), 577
- flos-cuculi* (422)
- Lygodium* 587
- Lyme grass 592
- Lysichiton* 483
- Lysimachia* 208, 220, 483, 570, 1112
- Lythrum* 483

## M

- Macartney rose 546
- Macleania* 208, 220, 573, 1100
- Madonna lily 326, (331), 1093
- Madwort 148
- Magnolia* 60, (344), 519, (520), 530, 571, 861,  
 1103, 1104
- history 15, 16, 20
- pests 401
- pruning 488, 500
- Mahonia* 21, 520, 530, 531, (561), 571, 963, 1102,  
 1106
- Maidenhair fern 583, 586, *see also* *Adiantum*

- Maidenhair tree (497), (503), 515, 571  
*Malcolmia maritima* 161, 1075, 1076  
 Male fern 582, 584, 1106  
 Mailing-Merton root stocks 692  
 Mallow 160, 207  
*Malope* 161  
*Malus* 520, 565, 1107  
 Mammals in the garden 1159  
*Mammillaria* 627, (628)  
 Mandrake 1091, (1091)  
 Mangold wine 830  
 Manna grass 474, 593, *see also* *Glyceria*  
 Manure 85, 101-110  
   farmyard 105  
   fish 104  
   hop 106, 465, 1097  
   hot-bed 913  
   liquid 108  
   poultry 106, 114, 115, 1097  
   stable 105  
 Manuring, green 113  
   double green 114  
 Map garden 1075  
 Maple 372, 489, *see also* *Acer*  
*Maranta* 653, 665, (667), (675), 676  
 Marguerite 1107, 1112, 1115  
   carnations 929  
 Marigolds 118  
   African 17, 167  
   diseases 348  
   French 167, 1080  
   pests 383  
   pot 149  
 Marjoram 860, (860), 868, (868), 1113  
 Mari 84  
 Marmalades 835  
 Marrows 1032, (1033)  
   chutney 845  
   diseases 352, (375), 376  
   exhibiting 1066  
   pickle 842  
   varieties 1033  
*Marrubium variegatum* 579  
 Marsh marigold 66, 473  
 Marsh samphire 615  
 Martins (1158), 1159, 1173, (1175)  
 Masson, Francis 20  
 Masterwort 189, 481  
*Matricaria* 161, 224  
*Matthiola* 161, (171), 172, 1080  
*Maxillaria picta* 829  
 May 511, *see also* Hawthorn  
 Mayweed 599  
 Meadow saffron 305  
 Meadow-rue 215  
 Meadowsweet 481  
*Meconopsis*, history 24  
   diseases 365, 372  
 Mediterranean, plants from 24  
 Medlars 802
- Medlars — continued  
   jelly 839  
   varieties 803, (804)  
*Melandrium* 208  
*Melissa officinalis* 865  
 Melons 898, 914  
   varieties 899  
 Mendel, Johann 26  
*Mentha* 289, 294, 563, 579, 673, 868, 869  
*Menyanthes* 474  
 Menzies, Archibald 21  
*Mertensia* 208, 217, 1100  
*Mesembryanthemum* 164, 625, 627, 628, 1076, 1112  
 Metham-sodium 400  
 Mexican breadfruit 653  
 Mexican orange blossom 510, 571  
 Mexican poppy 149  
*Mezereon* 512, (512)  
*Mibora* (589), 592  
 Mice 1163, (1163)  
 Michaelmas daisies 187, 188, 947, 1087, 1100  
   diseases 348, 365  
   division of 129, 181  
   powdery mildew on 365, (366)  
 Micro-climates 16, 634  
*Microlepis* 587  
 Midget beds and borders 177  
 Mignonette 165, 1078, 1112  
 Mildew 188, 348, 365, 975  
 Milfoil 183  
*Milium effusum aureum* 570  
 Milkweed 481  
 Millipedes (382), (383), 1183, (1183)  
*Mimosa pudica* 1078  
*Mimulus* (159), 164, 483  
   alpine 289, 294  
 Mineral deficiencies 91, 109, 683  
 Miniature gardens 672, (672)  
   for children 1080  
 Miniature sunflower 157  
 Mint 579, 860, (860), 868, (869), 1113  
   rust 368, (375)  
   variegated 563  
*Miscanthus* 579, 593  
 Mock orange 522, (522), 570, 1102  
 Moles 1160, (1160)  
*Molinia* 593  
*Mollusca* 1182, (1183)  
*Monarda* 130, 209, 484  
   dividing 181  
 Monkey flower 164  
 Monkey puzzle 21, 505  
 Monkshood 184, 480  
*Monstera deliciosa borsigiana* 653, (657), 665, 666, 967  
*Montbretia* 319, 566  
 Monterey cypress 511, 557  
 Monuron 414, 421, 424  
 Moon daisy 193



Moonwort 172  
 Moraines, constructing 302  
*Morisia* 283, 289, 293, 295, 1109  
*Morning glory* 160, 1075, 1113  
   pests 410  
*Morus* 1104  
 Mosaic 349, (359), 369, (370), (375), 376  
 Mosquito 1189, (1189)  
 Moss, destroying in lawns 414, 603, 605  
   gardens 679  
   sphagnum 134, 136, (137), 640  
 Moss rose 958, (966)  
   created 525  
 Moth mullein 173  
 Mother-in-law's tongue 659  
 Moths (382), 384, 385, (386), (387), 388, 393,  
   (394), 396, 397, (398), (402), 405, (406), (407),  
   1189, 1192, (1192), (1193)  
 Mount Etna broom 515  
 Mountain ash (495), (502), 526, 958  
   pests 409  
 Mountain avens 286  
 Mouse-tail plant 1078  
 Moutan paeony 521  
 Mowers, *see* Lawns  
 Mulberries 801, (801)  
   black, history 17  
   wine 830  
 Mulching 91, 97, 498, 794  
 Mullein 173, 216  
 Munstead dwarf 518  
 Muriate of potash 102  
*Muscari* (318), 319, (668), 1107  
   for forcing 671  
 Muscat syrup 855  
 Musk 289, 483  
   history 21  
 Musk rose 546, 556  
 Mussell scale (395), 397, 409  
 Mustard 1092  
 Mustard and cress 114, 1034, 1076, 1079, 1085  
 Mutants 24  
*Myosotis* (170), 172, 475, 1112  
*Myriapoda* 1183  
*Myriophyllum* 475, 480, 1082  
 Myrrh tree 1091  
 Myrtle 520  
*Myrtus* 500, 520

# Naming of plants — continued

in Latin 1218  
*Narcissus* 267, 310, (311), 671, 1093, 1101, 1107,  
   1112  
   angel's tears 955, 1081  
   bulb (311)  
   *cyclamineus* (311), 312, 1081  
   diseases (366)  
   double 312  
   history 24  
   *jonquilla* 312  
   large-cupped 310  
   miscellaneous 312  
   planting (310)  
   *poeticus* (311), 312  
   small-cupped (311), 312  
   *tazetta* (311), 312  
   *triandrus* 312, 1081  
   *albicus* 955  
   trumpet (310), (311)  
*Narcissus* fly 310  
*Nasturtiums* 28, 168, (859), 868, 1078, 1107, 1113,  
   1115  
   pests 404  
 National Chrysanthemum Society 1070  
 National Dahlia Society 1070  
 National Growmore Fertilizer 108, 548  
 Nature calendar 1201-1216  
*Neanthe bella* 653, 665  
*Nectarines* 753, 1107  
   varieties 758  
*Nemesia* (158), 164, 1101, 1112  
*Nemophila* 164, 266  
   history 21  
*Neoregelia caroliniae tricolor* 653, 664  
*Nepeta hederacea variegata* 578  
*Nephrolepis exaltata* (586), 588  
*Nerine* 319  
 Nettles 176, 983  
   control 415, 421  
 New Zealand daisy 1102  
 New Zealand flax 565, 961  
 New Zealand spinach 1054  
 Newtons 1167, (1167)  
*Nicotiana* 164, (166), 1107  
 Nielson's ivy 651  
*Nigella* 164, (166), 1078  
 Night-scented stock 161  
 Nitrogen 85, 86, 87, 88, 101, 113  
   cycle (86)  
 "No digging" theory 87  
 Noah's ark juniper 518  
 Non-flowering plants 47  
 North American maidenhair 583, 586  
 Norway maple 565  
 Norway spruce 558  
*Notocactus* 628, (629)  
*Nuphar* 463, 475  
 Nurserymen, establishment of 30  
   in horticultural progress 35

# N

Naked ladies 316  
 Namaqualand daisy 168  
 Naming of plants 26

Nutrient deficiencies, temporary 264  
 Nuts 809  
   in the Bible 1090  
*Nymphara* (456), (464), (466), (469-471), 470  
*Nymphoides* 475

## O

Oak 523, 555, 1080, 1090  
   diseases 365, 372  
 Oat 591  
 Obedient plant 130, 212  
*Ocimum basilicum* 865  
*Odontoglossum* (920), (921), 922, 928  
*Oenothera* 209, (211), 217, 220, 1076, 1100  
   alpine 289, 293  
   Old man 505, 550, (550)  
   Old man cactus 621  
   Old pheasant's eye 312  
 Oleander pests (399), 401  
*Olearia* 521, 530, 576, 1100, 1102  
*Omphalodes* 289, 294  
*Oncidium* 928  
 Onion fly 1034, 1036  
 Onion grass 593  
 Onions 29, 75, 976, 1034, (1036-1038), 1091  
   diseases 365, (375), 376  
   exhibiting (1066), 1067  
   general care 1036  
   pests 385, (387), 388, 389, 408  
   pickled 843, 1038  
   varieties (1035), 1038  
   weed control 420, 424  
*Onoclea* 584  
*Onopordon arabicum* 564, 577  
 Opium poppy 165  
*Opilomenus hirtellus* 593  
*Opuntia* 628, (628), (629)  
 Orach 566  
 Orange lily 326  
 Orange, plant grown from a pip (677)  
   tree 1084  
   wine 830  
 Orchard, plan of (684)  
 Orchids 920-928, (920), (921), (924), (925), (926)  
   history 20, 22  
   pests 401  
   selection 922  
   suggested plants 927  
 Oregon grape 1106  
*Oreocereus* 629  
 Organic matter 85, 86, 87  
 Organo-mercurial dust 372, 973

*Origanum* 562, 570, 868  
 Ornamental grasses 589-593  
*Ornithogalum* 320, 947  
*Orontium* 475  
*Osmanthus* 1103  
*Osmunda* 584  
 Oswego tea 484  
*Othonnopsis cheirifolia* 563, 567  
 Ox eye 481  
*Oxalis* 24, 280, 289, (289), 293, 294, 295  
 Oxygenators 467, 469

## P

*Pachyphytum* 629, (629)  
*Pachysandra* 573, 1106  
 Padder tennis court (611)  
*Pacony*, see *Paeonia*  
*Paeonia* 209, (211), 500, 521, (523), 1100  
   division 131  
   history 17, 21, 22, 28  
   stem wilt (367)  
 Painted tongue 167  
 Pampas grass 592  
*Panicum* 592  
 Pansies 1080, 1101, 1112  
   cuttings 283  
   exhibiting 1071, (1072)  
   sowing seed 122, 1080  
 Panther lily 329  
*Papaver*, annual 165  
   biennial 172  
   perennial 209  
 Parkinson, John 18, 20, 34  
 Parlour palm 653  
*Parodia* 629  
*Parsley* (860), 868, 1113  
   pests 389  
   seed sowing 120  
 Parsley fern 583  
 Parsley ivy 651  
 Parsley pieri 602, (602)  
 Parsnips 1039  
   diseases 365, (378)  
   exhibiting 1065  
   general care 1039  
   pests 385, 388, 408  
   seeds 119  
   seed-saving 70  
   varieties (1039), 1040  
   wine 830  
 Partridge-breasted aloe 620  
*Passiflora* (545), 546, 1103

- Passion flower 546  
 Pasque flower 213, 1076  
 Paths 1121, (1122), (1124-1128)  
   alpiners for 295  
   in rock gardens 300  
   in town gardens 1096  
   weedkillers for 414, 421  
 Patios and terraces 1135, (1136-1139)  
   screens for 1142  
 Paul's double scarlet thorn 511, (512)  
 Peaches 753  
   diseases (354), 369  
   feeding 754  
   in children's gardens 1080  
   in tubs 1107  
   pesta 397, 401, 404  
   preserved 836  
   slices in jelly 838  
   spiced 844  
   suckers 132  
   trees 493, 754  
     bush 754, (757)  
     fan-trained 754, (755), (756)  
     planting 754, (755)  
     pruning 489, 491, 754, (755), 757  
     thinning 757  
   varieties (752), 758, (758), (759)  
 Pearl grass 591, (591)  
 Pearlwort, control of 411, 602, (602)  
 Pears 760  
   bud development (765)  
   chutney 845  
   compatible varieties 760  
   diseases 347, (354), 364, 369  
   exhibiting 1062, (1063)  
   family tree 764  
   history 20  
   in tubs 1107  
   marmalade 836  
   pests (395), 396  
   seeds 70  
   self-sterile varieties 760, 764  
   stock for budding 136, 687  
   tree types 761, (762), (764)  
   varieties (760), 765, (766-771)  
 Peas 1040  
   diseases 365, 376, (378), 1041  
   dispersal of seed 70  
   exhibiting 1067, (1067)  
   general care 1041  
   history 29  
   pesta 384, 385, (387), 388  
   seed saving 70  
   sowing 119, 1040, (1041)  
   supporting (1042)  
   tendrils 55  
   varieties 1042  
   weed control 420, 424  
 Peat 106  
 Pebble plant 627  
 Pectin in fruit 833  
*Pelargonium* 629, 908, 967, 1107, 1112, 1115, 1217  
   cuttings (116)  
   diseases 364, 365  
   ivy-leaved 908, 910  
   show 908  
*Pellaea* 588  
*Peltandra* 475  
 Pencil cedar 537  
*Pennisetum* 592  
 Pennyroyal 869  
*Penstemon* 209, 217, 289, 293, 294, 295, 1100, 1109  
*Peperomia* 656, (659), 664, 665, 666, (667), (675), 676  
 Pepper 656  
 Peppermint (859), 869  
 Perennial phlox (174), 212  
 Perennial weeds, control of 415  
 Perennials, hardy 174-220  
   beds and borders 176, 177, (178), (182), (186), (190), (193)  
   planning 179  
   exhibiting 1069, 1071  
   for chalky soils 220  
   for exposed sites 217  
   for heavy soil 220  
   for town gardens 217  
   spread of 180, 182  
   staking 181  
   suggested plants 182  
   under cloches 892  
   weed-control 181  
 Pergolas 1097, 1144, (1146), (1147)  
   with roses 256, (262), (1116)  
 Pericarp 70, (73), (74)  
 Periwinkle 130, (344), 1106  
*Pernettya* 521, (521), 530, 531  
 Pershore stock 773  
 Pesticides 380, 888  
 Pests 380-410, 1197  
   control with electricity 918  
   fruit garden 391, 709  
   general garden 381  
   greenhouse 397, 888  
   in the Bible 1089  
   of decorative plants 247, 266, 277, 401  
   of house plants 641  
   sap-sucking 504  
   vegetable garden 385  
*Petroselinum crispum* 868  
 Petunias (162), 165, 947, 1107, 1112, 1115  
   diseases 353, 364  
   propagation 118  
*Peucedanum graveolens* 866  
*Phacelia* 165, 266  
*Phalaris* 579, 593  
 Pheasant's eye 148  
 Phenomenal berry 807



- Philadelphus* 491, 499, 501, 522, (522), 530, 570, 578, 958, 1102  
*Philodendron* 656, (660), 664, 665, 666, (678), 967  
*Phlox* 31, (163), 165, (174), 212, 579, 1100, 1112  
 alpine 282, 289, 293, 294  
 division 129  
 history (31)  
 leaf spot (367)  
 mulching 212  
 pests 404, 405, 408  
 propagation 127  
*Phormium tenax* 563, 565, 961, 963  
 Phosphatic fertilizers 102  
 Photosynthesis 57, 62, 63, 64  
*Phyllitis* (580), 584, 1106  
*Physalis* 130  
*alkekengi*, history 17  
*Physostegia* 130, 212, 217, (218), 220, 1100  
*Phytophthora infestans* 360  
 Piccolilli 842  
*Picea* (495), (503), 522, 557, (559), 560, 566  
 Pickarel weed 475  
 Pickles 840  
 Pickling walnuts 813, 843  
 Pigeons 1172  
 Piggy-tail flower 642  
*Pilea* 658, 664, 676, (678)  
 Pimpernel 148, 480  
*Pimpinella anisum* 865  
 Pincushion flower 167  
 Pine 522  
 Pineapple, candied 857  
 growing from a top 677, 1085  
 Pink Queen of Rio 647  
 Pinks, *see also Dianthus*  
 for edging 267  
 pipings 128  
*Pinus* 522  
 Pipings for propagation 128  
 Pips, plants from 677, (677), 1084  
 Pitcairn, Dr. 20  
*Pittosporum* 571  
 Plane tree, history 25  
*Plantago* (419), 566  
 Plantain 599, (602)  
 hoary (419)  
 Plantain lily 206, 482, 1106  
 Plants 47-75  
 breeding 26  
 classes of 47  
 diseases of 347  
 early collectors of 17  
 for children's gardens 1076  
 for town gardens 1100  
 importing 361, 1198, 1199  
 in the Bible 1088-1093  
 naming 26  
 non-flowering 47  
 quick-return 1078  
 Plants—continued  
 under glass 893  
 Plantamen in history 30  
 Plastics, in the garden 892  
*Platycerium* (587), 588, 658, 665  
*Platycodon* 289, 293  
*Pleiospilos* 628, 630  
 Plum and apple butter 840  
 Plums, damsons and gages 773  
 cheese 840  
 chutney 845  
 diseases (355) 369  
 exhibiting 1062  
 flowering 523  
 jam 835  
 pests 392, 393, (395), 396, 397  
 pickle 844  
 propagation 687  
 pruning 489, 491, (775), (776), 777  
 support for branches (778), 779  
 training (776)  
 trees, types of 773, (774)  
 bush 773  
 fan-trained 773, (774), (777)  
 half-standard 773  
 pyramid 778  
 standard 773  
 varieties (772), 782, (780-782), (784), (785)  
 weed control 414, 415  
 wine 830  
*Poa nemoralis* 1096  
 annua (412)  
 Pococke, Rev. Edward 18  
*Polemonium* 212, 217, 220, 1100  
 Pollen, refrigeration of 25  
 Pollination 67, 71, 685, 697, 719, 764, 777  
 by bees 69  
 by beetles 69  
 by butterflies 69  
 by flies 69, 727  
 by moths 69  
 Polunin, Oleg 24  
*Polyanthus* 1101, 1107, 1112  
 leaf spot (367)  
*Polygonatum* 1106  
*Polygonum* 212, 217, 220, 546, 578, 1100, 1103  
 alpine 289, 293, 294  
 aviculare (422)  
*Polypodium* 582, 588  
*Polystichum* 584  
 Polythene 125, (125), 134, (135), 146, 462, 885, 902, 967  
 Pomegranate 1084, (1088), 1090  
 Pondweed 480, (1083)  
*Pontederia* (466), 475, (477)  
 Pools 456  
 cleaning 469  
 concrete 458, (460), 1157  
 alkalinity of 460  
 building (459)

## Pools — continued

- for children's gardens 1075
- formal and informal 458, (465)
- in the Bible 1089
- in town gardens 1097
- livestock in 468
- miscellaneous containers as 458, 461
- planting 463, 467
- polythene sheeting for 462
- pre-fabricated 461
- raised (1157)
- types of 458
- winter care of 463

Poplar 131, 570, *see also* *Populus*

## Poppies 165, 173, 209

- history 24
- pests 404
- propagation 128

## Poppy of the dawn 573

*Populus* 570, 577

## Porcupine quill 476

## Portugal laurel 523, 555, 560, 1102

- silver leaf disease in 369

*Portulaca* 165

## Pot marigold 149

## Pot plants, exhibiting 1068

*Potamogeton* (478), 480

## Potash 101, 102, 107

## Potato vine 547

## Potatoes 1043

- as a cleaning crop 1043
- certification scheme 361, 1043
- clamp 1046, (1046)
- diseases 360, 376, 378, (379), 1044
- division 131
- exhibiting 1067
- general care 1044
- history 17, 32
- pests 383, 384, (387), 388, 397
- planting 1044, (1044), (1045)
- preparing tubers 1043, (1045)
- salad 1047
- tubers 57
- varieties (969), 1046
- wine 831

*Potentilla* 213, 217, (219), (416), 491, 500, (521), 522, 530, 577, 1109

- alpine 290, 293, 294, 295

## Pot-et-fleur 679, (965)

## Pot-herbs 29

## Pot-pourri 864

## Pots 121, 122

- clay 887
- open-ended 902
- plastic 887

## Potting compost 106, 111, 887

## Poultry manure 104, 106, 114

## Powdery mildews 365

## Prayer plant 643, 653

## Pre-emergence rot 973

## Presents, plants as 1085

## Preserving 832-857

- bottling 846
- butters 839
- canning 851
- chutneys 844
- conserves 836
- crystallization 857, 865
- deep freezing 856
- drying fruit 855
- for winter use 853
- fruit cheeses 837
- fruit syrups 854
- jams 832
- jellies 837
- marmalades 835
- pickles 840
- spiced fruits 844

## Prickly poppy 149

## Primroses (345), 484, (1082), 1101, 1112

*Primula vulgaris* (419)

## Primulas 484, 566, (909), 1113

- allergy to 911
- alpine 290, 294, 295
- candelabra 484
- diseases 356, 372
- for the sink garden 1081
- history 22, 24
- in the greenhouse 910
- leaves 66
- pests 405
- propagation 118

## Prince's feather 148

## Privet 554, 560, 570, 1102

- clipping 549

- common 555

## Privet thrips 410

## Propagating cases 915

## Propagating frame 124, 914

## Propagation 116-143

- adventitious roots in 54
- by budding and grafting 136
- by cuttings 123
- by division 129
- by layering 132
- methods (116)
- mist propagator for 919, 932
- rooting media for 124
- seminal 118
- suckers 131
- tubers 131
- vegetative 123

## Pruning 485-491

- aims of 485
- calendar for 491
- cordon-trained trees 489
- heading back (485)
- large branches (490)
- Lorette 703, 706
- spur system 705

## Pruning—continued

- summer 489
- terminology (486), (487)
- thinning out (485)
- time for 488
- tools (488), 489
- Prunus* (493), (498), (502), (503), 522, 530, 531, 555, 560, 565, 809, 1079, 1102, 1103, 1104, 1107

## history 22

*persica* 523

## pruning 489

## Pseudo-bulbs, of orchids 923, 927

*Pseudotsuga* (496), (502), 523*Pteridium aquilinum* (423)*Pteris* 588, (588), 677*Puccinia menthae* 368*Pulmonaria* 213, 217, 220, 579, 1100*Pulsatilla* 213, (218), 290, 293, 1076, 1100

## Purple loosestrife 483

## Purslane 165

*Puschkinia* 320

## Putting course (612)

*Pyracantha* 500, 530, 531, 546, (554), 555, 560, 1100, 1102, 1103

## propagation 119

*Pyrethrum* 213, (218), 220, 570

## pests 405

*Pyrus* 564, 576, 1107

## Q

## Quaking grass 591

## Quamash 315, 481

*Quercus* (497), (503), 523, 555

## Quick 511

## Quick-return plants 1078

## Quinces 491, 802

## jelly 838

## marmalade 835

## varieties 802, (805)

## R

## Rabbits 695, 1162, (1162)

## law concerning 1194

## Radishes 1047, 1079

## pests 388, 389

## Radishes—continued

## varieties 1048, (1048), 1049

## winter 1048

## Raffia 138, (138), (139)

## Ragged robin (422)

## Ragwort 215, 484, 526, 1200

## in lawns 411

## Rainbow cactus 623

## Raisin wine 831

## Raking 96

*Rananda* 290, 294*Ranunculaceae* 67*Ranunculus* 214, 220, (417), 475, 480

## alpine 290, 293, 295

## diseases 372

*Raoulia* 290, 1109

## Raspberries 786

## autumn-fruiting 788

## certification scheme 361, 786

## diseases 349, (359), 364, 369

## jam 835

## pests 384, (391), 392, 396

## pruning 491

## training (787), 788

## varieties 788, (789)

## weed control 415

## wine 831

## Raspberry beetle (391), 396, 749

## Raspberry mosaic (359)

## Rat's tail cactus 620

## Rats 1163, (1164)

## Ravenholst ivy 652

*Rebutia* 630

## Red currants 790, (791)

## jelly 839

## protection from birds 792

## varieties 792, (792)

## wine 831

## Red hot poker 207

## Red mountain orch 566

## Red spider mite 396, (398), 400, 618, 641, 1022

## Reed mace 476

## Reeves, John 21

## Reptiles 1168

*Reseda* 165, 1078*Rheum* 573*Rhipsalidopsis* 630

## Rhizomes 57

## propagation 130, (130)

*Rhododendron catawbiense* 20

## Rhododendrons and azaleas 530, 531, 532-538, 1102, 1107

## alpine rose 533

## diseases (367), 372

## history 16, 17, 20, 24, 38, 533

## layering 132, (132)

## management 491, 500, 501, 535

## pests 400, 405, (406), 409

## planting 497, (534), 535

## varieties (533), (535), 536, (536), (537)



- Rhodohypoxis* 290, (290), 673  
*Rhoicissus rhomboidea* (632), 659, 664  
 Rhubarb 977, 1049  
   and ginger jam 835  
   diseases 377  
   pests 388  
   varieties 1049  
   wine 831  
*Rhus* 64, 130, 131, 500, 524, 530, 531, 562, 565, (568), 1102  
 Ribbon grass 593  
*Ribes* 500, 524, (524), 530, 570, 1102  
*Ricinus* 119, 167  
 Ridging 95, (96)  
 Ring culture of tomatoes 902  
 Ring turf-renovator 612  
*Robinia* 524, 530, 570, 1104  
   *pseudacacia* (494), (502)  
 Rock for gardens, expense of 296  
 Rock gardens 279-303  
   alpines for 279  
   annuals for 149, 164  
   bridge for (1151)  
   construction 296, (296-301)  
   dwarf azaleas for 538  
   dwarf spruces for 522  
   history 20  
   management 279  
   miniature (299), 303, 672  
   moraine and scree 302  
   paths in 300  
   pests 280, 281  
   plants to avoid 280  
   roses for 256  
   types of rock 298  
   water in 300, (302), (303)  
 Rock jasmine 149  
 Rock rose (345), (508), 510, 1093  
 Rocket larkspur 156  
 Rodents 1163  
*Rodgersia* 484  
*Romneya* 567  
   propagation 128  
 Roof-top gardens (1084), 1085  
 Rook (1174), 1176  
 Root 51, 53, (54)  
   biological function of 51, (52-55)  
   cuttings (127)  
   in leguminous plants (87)  
   maggots 389  
   stock 136, 687  
 Root mealy bug 618  
 Root-absorption of water solution 52  
 Root-ball 497  
 Rooting cuttings 127  
 Roots of trees, law concerning 1195, 1200  
 Root-top garden 1084, (1084)  
*Rosa* 524, 555, 565, 1103, 1109  
   *alba* 266  
   Bourbon 266  
   *Rosa* — continued  
     *canina* 265  
     *centifolia* 266  
     *gallica* 266  
     *multiflora* as stock 137, 265  
     *rubrifolia* 565  
     *rugosa* 131, 255, 265  
       as stock 137, 266  
 Rose aphid 404  
 Rose geranium jelly 838  
 Rose hip syrup 855  
 Rose moss 165  
 Rose of heaven 161  
 Rose of Sharon 517, 1101, 1106  
 Rose thrips 410  
 Rose, white, of York 525  
 Rosemary. *see Rosmarinus*  
 Roses 252-272  
   bush 255, 258, (259)  
   cuttings 129, 266  
   diseases 261, 266, 348, 353, 364, (367), 369, 373  
   development of (46)  
   exhibiting 1073, (1073)  
   *floribunda* 255, (257), 271, 1100  
   varieties 269, (269)  
   for hedges 555, 560  
   formal garden for (263)  
   general treatment 265  
   greenhouse 911  
   history 16, 17, 26  
   hybrid tea 255, (259)  
   varieties (252), (256), (259), 267, (267), (268), (271)  
   in children's gardens 1075, 1078  
   in sink gardens 256  
   Japanese 131  
     for stock 137  
   miniature 256, 673, 1113  
   varieties (257), 272, (272)  
   pergolas and arches for 256, (262)  
   pests 261, 264, 266, 391, (395), 404, 405, (406), 408, 409, 410  
   propagation 129, 137, 265  
   pruning 260, 485, 491, 501  
   ramblers and climbers 255, (255), 546  
   varieties 271  
   "rose sick" soil 260  
   shrub 524, 530  
   standard (254), 255  
     budding 266  
     planting 258, (259)  
     stock for 266  
   stratification of seed 119  
   walls for (262)  
   weedkillers for 420, 424  
*Rosmarinus* 500, 525, 530, 531, 556, (557), 560, (561), 572, (859), (860), 869, (869), 1100, 1102, 1107  
 Rotation plans 352, 970, (970), (971)

Rowan 526  
 jelly 838  
 Royal fern 584  
 Royal gardens 30  
 Royal gardens of the Bible 1089  
 Royal Horticultural Society 21, 24, 34, 239, 1062  
 Rubber plants 640, 649  
 Rubbish, law concerning 1198  
*Rubus* 491, 501, 525  
*Rudbeckia* (163), 167, 214, 220, 567, 1100  
 pests 405  
 Rue 869, (869), 1092, *see also Ruta*  
 Rugby football plant 656  
*Rumex* (417), 870  
 Rush (422), 474  
 Russian vine 546  
 Rust diseases (355), (358), (362), (366), 368, 369,  
 (370), 372, 373, 374, (375)  
*Ruta* 563, 567, 579  
 Rye-grass 1096

# S

Saffron 305, 1092  
 Saffron spike 642  
 Sage 167, 214, 563, 860, (860), 863, 870, (870)  
*Sagittaria* (466), 476, (477), 1082  
 St. Bernard's lily 186, 643  
 St. Dabeoc's heath 512  
 St. John's Wort 130, 288, 517  
 St. Julien A (East Malling) stock 720, 773  
*Saintpaulia* 659, 664, 676, 919  
 in a bottle (674)  
 leaf-cuttings 127  
 under glass (881), (905)  
 Salads, early 914  
*Salicornia herbacea* 615  
*Salix* 291, 295, 499, (499), (500), 501, (503), 525  
*Salpiglossis* 167  
 Salsify 1050  
*Salvia* 144, 167, 214, 217, 220, 561, 562, 563,  
 (563), 565, 570, 572, 577, 1080, 1100,  
 1107, 1113  
 diseases 364  
 pests 404  
*Sambucus* 525, 530, 570, 578  
 Sandwort 284  
*Sansevieria* 659, (662), 664, 665, (678)  
*Santolina* 525, 530, 531, (563), 576, 861, 1113  
*Saponaria* 291, 293  
 cutting back 281  
*Sarcococca* 1106  
 Satin flower 292

*Satureia* 870  
 Sauerkraut 853  
*Saururus* (466), 476  
 Savory, summer and winter 870  
 Savoy, *see* Cabbages  
 Sawdust 107  
 Sawflies (391), (394), (395), 397, (406), (407), 409  
*Saxifraga* 291, 293, 294, 295, 1109, 1113  
*Scabiosa* 167, 214, 217, (219), 220, 1079  
*Scabiosa* 214, 1079, *see also Scabiosa*  
 pests 404  
 Scale insects (395), 397, (397), 398, (399), 401,  
 (406), (407), 409, 618, 641  
 Scarlet flax 161  
 Scarlet sage 167  
 Scarlet trails 646  
 Scarlet turkscap 327  
 Scented peony 209  
 Scentless mayweed (413)  
*Schefflera* 660, 665  
*Schizanthus* 118, 147  
*Schlumbergera* 630  
*Scilla* (319), 320, 1083, 1113  
*Scindapsus aureus* 661, 664, 967  
 Scion 136, (139)  
*Scleropus* 476  
*Scolopendrium vulgare* 584  
 Scotch heather 507  
 Scotch laburnum 518  
 Scottish flame flower 547  
 Scree 302  
 Screens 1140, (1145)  
 for town gardens 1097  
 hedging 548  
 lattice 1097  
 planting 548  
*Scrophularia* 579, 1100  
 Sea buckthorn 516  
 Sea holly 200, 567  
 Sea lavender 207  
 Seakale 1050  
 varieties 1051  
 Seakale, decorative 196  
 Seakale-beet 995  
 varieties 995  
 Seaweed 107, 108  
 Secateurs 124, (488), 489  
*Sedum* 214, 217, 220, 291, 566, 567, 579, 630,  
 (630), 661, 665, 666, 673, (678), 1081,  
 1101, 1109  
 alpine 291, 293, 294, 295  
 leaf-cuttings 618  
 Seed beds, preparing 119, 144  
 Seed box (121)  
 Seed-leaves 123  
 Seedlings, diseases of (363), 364  
 pricking out 123, (123), 147  
 recognition 145  
 vegetables thinning out (974), 975  
 Seeds Act 1920 1199

- Seeds, biological function **47**, (50)  
 dispersal **70**  
 formation **70**  
 germination **48**  
 hybrids **75**  
 in children's gardens **1077**  
 propagation **118**  
 saving **75**  
 sowing **119**  
 storage **118**  
 stratification **119**, (119)  
 treatment against plant diseases **357**  
 types **118**  
 Self-heal (602)  
*Selinum* **573**  
*Sempervivum* **291**, (291), **293**, **294**, **295**, **566**, **673**,  
 1081  
 rust (370)  
*Senecio* **215**, **412**, **476**, **484**, **491**, **500**, **526**, **530**,  
 562, **563**, **576**, (614), **631**, **1102**  
*vulgaris* (412)  
 Sensitive fern **584**  
 Sensitive plant **1078**  
 Sequestrene **354**, **373**, **535**  
*Sequoia* **566**  
 Sewage sludge, dried **104**  
 Shallots **1051**, (1052)  
 certification scheme **361**  
 diseases **377**  
 exhibiting **1067**  
 pests **388**, **392**  
 varieties **1052**  
 Shasta daisy **193**  
 Shellestone **711**  
 Shepherd's purse **352**, (413), **599**  
 Shirley poppy **165**  
 Shoddy **107**  
 Shrews **1161**, (1161)  
 Shrub roses **524**, **530**  
 Shrubby cinquefoil (521), **522**  
 Shrubby ragwort **526**  
 Shrubs and trees **492-531**  
 cuttings **129**, **504**  
 for autumn colour **531**  
 for chalky soils **530**  
 for peaty soils **530**  
 for poor soils **531**  
 for shade **531**  
 for town gardens **530**, **1101**  
 for window-boxes **1113**  
 general care **497**  
 pests and diseases **504**  
 planting **494**, **496**  
 suggested plants **505**, see also Foliage  
 Siberian bugloss **481**  
 Siberian wallflower **170**  
*Stalcea* **215**, **217**, **220**, **1101**  
 Siebold, Philipp von **22**  
*Silene acaulis* **292**, (292), **293**, **295**  
*vulgaris* (418)  
 Silk tassel bush **545**  
 Silver bell **515**  
 Silver birch **507**  
 Silver leaf (355), **368**, **372**  
 Silverweed (416)  
 Simazine **414**, **415**  
*Sinapis alba* (418)  
 Sink gardens **303**, **1109**  
 as children's gardens **1080**  
 Sistan **400**  
*Styrinchium* **292**, (292), **673**  
*Skimmia* **526**, **531**, **1102**  
 Slater **1182**, (1183)  
 Slipper flower **149**  
 Sloe wine **831**  
 Sloping sites, dealing with **1118**, (1119)  
 Slow worm **1169**, (1169)  
 Slugs **277**, (383), **384**, **389**, **397**, **989**, **992**, **1061**,  
 1182, (1183)  
 Small bindweed (416)  
 Smallest of all **651**  
 Smoke bombs **356**, **888**  
 Smoke tree **565**  
 Snails **277**, **384**, **1182**, (1183)  
 Snake plant **659**  
 Snake's head fritillary **482**  
 Snakes **1168**, (1169)  
 Snake-skin plant **651**  
 Snapdragon **149**  
 Sneezewort **204**  
 Snowball bush **529**  
 Snowberry **958**, **1103**  
 history **21**, **38**  
 Snowdrop tree **515**  
 Snowdrops **317**, **1101**  
 history **24**  
 in flower arrangement **963**  
 pests **408**  
 Snowflake **319**  
 Snowy mespilus **505**  
 Soapy blight **935**  
 Sodium chlorate **414**, **421**  
 Soil **76-92**  
 acid **16**, **92**, **144**, **423**  
 alkalinity **16**, **92**  
 analysis **77**, (78)  
 chalky **34**, **79**, (80), **84**  
 chemistry **91**  
 clay **77**, (81)  
 colour **84**  
 components **77**, (78)  
 damp **422**  
 drainage **84**, **85**, **98**  
 grassing down **84**  
 in town gardens **1096**  
 living organisms in **87**  
 management **79**, **82**  
 micro-organisms **76**, **86**, **87**, **88**  
 moisture **88**, **90**, **91**  
 chart **90**



## Soil — continued

- nitrogen-absorbing bacteria 88
- nitrogen cycle in (86)
- organic matter 85, 86
- origin 76
- population 77
- profiles 76, 80, (81)
- sandy 77, (80), 422
- silt 77
- sterilization 356, 918
- structure 82, (82), 83
- testing 91
- texture 79
- till 78, 83
- types 79
- warming 913
- water retention 89, (89)
- wet (81)
- Soil operations 93–97
  - digging 93
  - liming 92
  - maintaining a good till 83
  - mulching 97
  - ridging 95
  - rolling 96
  - treading 96, 972
  - watering 90
- Soil-blocked plants 976
- Solanum* 546, (547), 1104
- Soldanella* 292, 295
- Solidago* 215, 217, 220, 1101
  - division 129
  - pests 405
- Solomon's seal 130, 1106
- Soot 104
- Sophora japonica* 1104
- Sorbaria* 526, 572
- Sorbus* (495), (502), 526, 531, 576, 1104
- Sorrel 411, (859), (860), 870
- Southernwood 491, 505, 550, (550), 571, (859),  
870
  - history 17
- Spanish bluebell 320, 1101
- Spanish broom (526), 527
- Spanish thistle 284, 1081
- Sparmannia africana* 967
- Sparrows 1179, (1179), (1180), 1181
- Spartina* 593
- Spartium* 491, (526), 527, (527), 530, 531
- Spathiphyllum wallisii* 661, (663), 666
- Spatterdock 475
- Spear thistle 1200
- Spearmint 868
- Species, description of 28
- Speedwell 280, (412), (416), (602)
- Spergula arvensis* (423)
- Sphagnum moss for air layering 134, (135)
- Spiced fruits 844
- Spices in the Bible 1089
- Spider plant 153, 643

- Spiders and harvestmen 1182, (1183)
- Spider-wort 216
  - history 18
- Spikenard 1089, (1090), 1092
- Spinach 1053
  - diseases 365, (379)
  - New Zealand 1054
  - pests 384
  - varieties 1053
- Spinach beet 1054
- Spindle tree (345), 513
  - pests 404
- Spiraea* 130, 201, 527, (527), 531, 1102
  - false 526
  - golden 570
  - herbaceous 201
  - pests (407), 409
  - pruning 491, 501
- Sports 14, 25
- Spotted flycatcher 1178, (1179)
- Spotted laurel 1101
- Spraying, damage by 602, 1196
- Sprays 357, 380, 381, 684, 709
  - for application of chemicals 360, 414
- Sprinklers, water 977
- Spruce (495), (503), 522, 557, *see also* *Picea*  
diseases 373
- Spurge 201
- Squashes 1055
  - varieties 1055
- Squirrel's foot fern 587
- Squirrels 1162, (1163)
- Stachys* 215, 217, (561), (562), 563, 577, 1101
- Stag's horn fern 588, 638
- Stag's horn sumach 131, 524, 1102
- Staging 886
- Stapelia* 631
- Star of Bethlehem 320, 1101
- Star of the veldt 156
- Starlings 1179, (1179)
- Statice* 207
- Station sowing 972, (973)
- Stellaria media* (412)
- Stems, structure of 54, (56)
- Stenocarpus sinuatus* 661, 664
- Steps (1117), 1129, (1131), (1132)
- Stereum purpureum* 368
- Sternbergia* 320
- Stripa* 592
- Stoat 1164, (1165)
- Stock 161, 172
- Stock, new, diseases of 353, 364, 373
  - for budding 136
- Stock dove (1170), 1172
- Stocks 118, 161, 172, 1113, *see also* *Matthiola*  
diseases 373
- downy mildew on 365
- flowering 1080
- night-scented 161
- Virginian 161, 1075 1076

- Stoke's aster 215  
*Stokesia* 215, 217  
 Stone fruits, residual chemicals 414  
 Storm damage, prevention 1217  
*Stratiotes* 479  
 Strawberries 793, 1107  
   alpine 795  
   certification scheme 361  
   conserve 836  
   diseases 349, (359), 364, 365  
   feeding 795  
   in barrels 795, (796), 1107  
   jam 835  
   pests 384, 388, 392, 408  
   propagation 132, (133), 794, (794)  
   remontant 796  
   seeds 70  
   varieties (793), 795  
 Strawberry tree (501), (503), 505  
 Strawflower 157  
 Stream gardens 464  
 Subsoil 76  
 Succulents 614-631, *see* Cacti and succulents  
 Suckers 131, (486), 501, 504  
 Sulphate of ammonia 102  
 Sulphate of potash 102  
 Sumach 130, 524  
 Summeradonia 148  
 Summer cypress 160  
 Summer holidays, care of the garden during 1217  
 Summer-flowering hyacinth 1101  
 Sun rose 288  
 Sunflower 157, 160, 205, 871, 1079  
 Sunken garden (1156)  
 Sun-ray plant 660  
 Superphosphate of lime 102  
 Swallows 1171, 1173, (1175)  
 Swedes 1055  
   diseases 365, 377  
   pests 388, 389  
   varieties 1056  
 Sweet bay tree 518, 1107  
 Sweet corn (891), 892, 1056  
   diseases 377  
   varieties (1056), 1057  
 Sweet flag 472  
 Sweet peas 273-278  
   bush-trained 275  
   classification 274  
   cordon-trained 276  
   damage by birds 277  
   diseases 277, 365, (370)  
   exhibiting 1073, (1073)  
   varieties for 278, (278)  
   for town gardens 1113  
   history (23)  
   methods of growing 275  
   pests 277, 404  
   staking 276, (276)  
   types 274  
 Sweet peas — continued  
   varieties (273), 277, (278)  
 Sweet rocket 172  
 Sweet sultan 152, 1079, 1112  
 Sweet William 172, 1101, 1113  
   diseases (370), 373  
   seed sowing 122  
 Sweetheart plant 658  
 Swifts 1171, 1173, (1175)  
 Swiss chard 995  
 Swiss cheese plant 653  
 Sword fern 588  
 Swordfish plant 651  
 Sycamore 70, 1080  
*Synchytrium endobioticum* 360  
 Synge, Patrick 24  
*Symphoricarpos* 579, 1103  
*Symphytium* 579, 866  
*Syringa* 500, 501, 527, 530, 531, 556, 1102, *see also* Lilac  
 Syrup, from berried fruits 854
- T**
- Table decoration (954)  
*Tagetes* 146, (163), 167, 1080, 1101, 1113  
   diseases 373  
 Tamarisk, *see* *Tamarix*  
*Tamarix* 528, 556, (557), 560, 572  
   pruning 491, 499  
*Tanacetum vulgare* 871  
 Tansy (859), (870), 871  
 Tap-root (52)  
 Tar oil 390, 391, 392, 394, 395, 397, 401, 410  
*Taraxacum officinale* (419)  
 Tarnished plant bug, 404  
 Tarragon (860), 871  
   vinegar 871  
*Taxus baccata* (498), (503), 528, 530, 558, 570, 1102  
 Tea plant, history 22  
 Tellima 573, 1106  
 Tenancy agreements 1197  
 Tenby daffodil 312  
 Tenni-quoits pitch (611)  
 Tennis court, grass 610  
 Terraces 1096, (1099), 1135, (1137)  
*Thalia* 476  
*Thalictrum* 215, 217, (219), 567, 1101  
 Thiram 145, 357, 362, 372  
 Thistles 415, 421, 1076  
   creeping 1200  
 Thorn 511

- Thornbury Castle garden 30  
 Thrift 186, 284  
 Thrips 337, (387), 388, 397, (403), 410  
 Thrushes (1176), 1177  
*Thuja* (493), (502), 528, 530, (558), 559, 560  
 Thyme 66, 292, (859), (860), 861, 871, 1111  
     creeping 282  
*Thymus* 292, 293, 295, 570, 871, 1109, *see also*  
     Thyme  
*Thiarella* 292  
 Tickseed 153  
 Tiger lily 330  
 Tiles for paving 1096  
 Time-of-day plants 1075  
 Tisanes 864  
 Tits (1176), 1177  
 Toadflax 161, 288, (418)  
     ivy-leaved, history 32  
 Toads 1166, (1166)  
 Tobacco plant 144, 164  
 Tobacco viruses 1058  
*Tolmiea menziesii* 673, (678)  
 Tomato and apple chutney 844  
 Tomatoes 899, 1057  
     bush 1060, 1077  
     chutney 845  
     diseases 353, 356, 364, 377, (379), 1059  
     dwarf 1060, 1077  
         exhibiting 1068, (1068)  
     history 17  
     juice 849, 885  
     outdoor 1057, (1059)  
         general care 1058  
         varieties (969), 1059  
     pickle 842, 843  
     purée 848, 854  
     sauce 845  
     seed saving 70  
     under glass 899  
         pests 400  
         varieties 903  
 Topiary 489, 549, 551, 558  
 Town and Country Planning Act 1947 1200  
 Town gardens 1094–1115, (1094), (1098), (1099),  
     (1102), (1105), (1108), (1110), (1114)  
     lighting 1097  
     lupins for 207  
     perennials for 217  
     planning 1096  
 Toxins 970  
 Trace elements 104, 105, 108  
 Tradescant, John 18, 32, 583  
*Tradescantia* 216, 217, 220, 661, 666, 676, 1101,  
     1115  
     history 18  
 Trailing plants (1117), 1144  
*Trapa* (466), 479, (479)  
 Traveller's joy, *see Clematis*  
 Treecreeper 1171  
 Tree lupin 519  
 Tree mallow 207, 1079  
 Tree of kings 647  
 Tree tomato 961  
 Trees 492–531  
     diseases 504  
     for town gardens 1104  
     from seed 1080  
     in the Bible 1089  
     law concerning 1195, 1199, 1200  
     on terraces (1138)  
     ornamental, pruning 489  
     pests 405, 409, 504  
     poisonous 1200  
     preserving shapes 504  
     raised beds as surrounds for (1138)  
     seats round (1155)  
     suggested plants 505  
 Trellis work (540), 1097, (1145)  
 Trespass of animals 1194  
*Trichocereus* (614), 631  
*Trifolium repens* (417)  
 Trinity flower 216  
*Tripleurospermum maritimum* (413)  
*Triteleia* 320  
*Trollius* 216, 484  
*Tropaeolum* 28, 168, 547, 567, 1078, 1107, 1113  
 Trough garden 279, 299, 303, 461, 1109  
*Tunga* 559, 560  
 Tubers, division 131, 244, (244)  
 Tuhs, plants in 461, (461), 1107, (1108)  
 Tulips 313, 955  
     cottage 313  
     Darwin 267, (304), 313, (314)  
     diseases 357, (370), 373  
     double early 313, (314)  
     forcing 668, 671, 919  
     history 18, 24  
     in children's gardens 1083  
     in town gardens 1101, 1107, 1113  
     lily-flowered 313, (314)  
     offsets 131  
     parrot 313, (314)  
     propagating 131, 1087  
     single early 313, (314)  
     varieties 313, (313), (314)  
     wild (314), 315  
 Turf, *see* Lawns  
 Turkecap lily 327, 329  
 Turner, William 17  
 Turnip cabbage, *see* Kohl rabi  
 Turnip flea beetle 1025, 1060  
 Turnip gall weevil (387), 389  
 Turnips 1060  
     diseases 377  
     dispersal of seed 70  
     hot beds for 914  
     pests 384, 388, 389  
     varieties (968), 1060  
     wine 831  
 Turtle dove (1170), 1172



Tweedie, Ruth 24  
Tycho 476

## U

*Ulex* 528, 530, 531  
*Ulmus* 556, 570  
 Umbrella tree 660  
 Urn plant 642  
*Ursinia* 168

## V

*Vaccinium* (528), 529, 530, 531  
Valerian 192  
*Valeriana* 571  
*Vallisneria* 1082  
*Vanda caerulea* 922  
Vanilla ice plant 656  
Vapam 400  
Variegated arrowhead ivy 652  
Variegated grasses 593  
Variegated yellow archangel 1106  
Variety, definition of 28  
Vases 949  
Vegetables 968-1061  
    application of weedkillers 420  
    catch crops 972  
    crop rotation 970, (970), (971)  
    diseases (374), (375), 376, (378), (379)  
    drainage 969  
    drought 977  
    early 914  
    effect of climate on 979  
    exhibiting 1064  
    for deep freezing 856  
    in the Bible 1091  
    inter-crops 972  
    manure 977  
    permanent crops 976  
    pests 385, (386), (387), 388, 975  
    planting 975  
    preserving 846, 856  
    seeds 972, (973), 978  
    chitting 974  
    facts and figures 978

**Vegetables, seeds** — continued  
selection 973  
sowing 972  
treating 973  
soils 969  
sowing 972  
sterilizing, time-table for 852  
thinning seedlings (974), 975  
under glass 889, (890), (891)  
watering 977  
weed control in 420, 424  
**Velitch berry** 808  
**Veitch, Harry** 21, 22  
**Venidium** 168  
**Ventilation, automatic** 885  
for orchids 923  
**Verbascum** 173, 216, 217, 577  
propagation 127  
**Verbena** (162), 168, 1107, 1113, 1115  
lemon, for flavouring 838,  
lemon-scented 519  
**Veronica** 216, 217, 220, 491, 563, 571, 577, 579,  
1101  
alpine 292, 293, 295  
propagation 282  
downy mildew on 365  
*filiiformis* 280  
*hederifolia* (412)  
*officinalis* (416)  
**Viburnum** 491, 500, 501, (526), 529, 530, 531,  
572, 1102, 1107  
**Villarsia** 476  
**Vinca** 130, 572, 579, 1106  
**Vine weevil** (399), 401, 404  
**Vines** 547, 815  
cordon pruning 816, (817), 818  
cultivation 816  
Guyot pruning 818  
double 818, (819)  
dwarf 818, (819)  
single 818, (820)  
in the Bible 1091  
leaves in flower arrangement 961  
pests 401  
planting 816  
propagation 127  
ripening and picking 820  
soil and preparation 815  
spraying 820  
under glass 895, *see also* Grapes  
varieties 821, (822)  
wall-trained (819)  
**Vineyards in garden history** 29  
**Viola** 267, 566, 1080, 1113  
alpine 292  
cuttings 283  
diseases 373  
dispersal of seed 70  
exhibiting 1071  
**Violets** 861, (1082)

- Violets — continued  
 diseases of (370), 373  
 sweet 871, (871)  
 under cloches 892  
 Viper's bugloss 156  
 Virginia creeper 547, 578  
 Virginian stock 161, 164, 1075, 1076  
 Virus diseases 348, 369, 371, 372, 373, 376, 377  
   control of 361  
   symptoms 349  
   vectors of 349, 385  
*Viscaria* 161, 208  
*Vitis* 547, 561, 565, (568), 578, 961, 1104, 1113,  
   *see also* Vines  
*Vittaria* 588  
 Voles 1164, (1164)  
*Vriexia splendens* 662, 664, 666, (667)

# W

- Wall pepper 291  
 Wall plants 539-547, 1103,  
 Wallflowers 170, 1101, 1107, 1113  
   diseases 373  
   dwarf 1080  
   pests 169, 405  
 Walls 1132  
   construction 1132, (1133), (1134), (1135)  
   fruit trees for 683, (689)  
   roses for (262)  
   trailing plants for 541, (1117)  
 Walnuts 812  
   bush trees 812  
   leaf blotch on (355)  
   pickled 813, 843  
   pruning 489  
   varieties 813, (813)  
 Wandering jew 661  
 Wandering sailor 661  
 Warblers 1178  
 Ward, Dr. Nathaniel 21, 674  
 Wasps 381, 1187, (1188)  
   on fruit, prevention 757  
 Water, aeration 979  
 Water chestnut 479  
 Water club 475  
 Water crowfoot 480  
 Water forget-me-not 475  
 Water fringe 475  
 Water gardens 456-484, (464), (465), (466)  
   in glass jars (1083)  
   indoor 1082  
   miniature (464)  
 Water gardens — continued  
   oxygenators 467, 469  
   plants for 470, (469-473), (477-480), (482)  
   tubs as (461)  
 Water hawthorn 473  
 Water heating, electric 917  
 Water hyacinth 478  
 Water lilies (456), 457, (469), (470), (471)  
   care and management 467  
   hardy, list of 470  
   methods of growing 463  
   pests 404, (407)  
 Water milfoil 475, 480, 1082, (1083)  
 Water plantain 473  
 Water primrose 474  
 Water snails 468, 1083  
 Water soldier 479  
 Water violet 480  
 Water willow 473  
 Watercress 1061, (1061)  
 Waterfall plant 643  
 Waterfalls 301, 462  
 Water-melon peperomia 656  
 Weasels 1164, (1165)  
 Weatherboards 1140  
 Weeder bars 414  
 Weedkillers 411  
   for lawns 411, 599, 602  
   for paths and waste ground 414  
   precautions 414, 420  
   trade names 421, 424  
 Weeds Act 1959 1200  
 Weeds 181, 227, 411-424, (412), (413), (416-419),  
   (422), (423)  
   as soil indicators (418), (419), (422), (423)  
   as spreaders of diseases 352  
   clearance in hedges 549  
   elimination by double green manuring 114  
   history of 16  
   in lawns 599, 602, (602)  
   in rock gardens 281  
   in water gardens 478  
   law regarding 1200  
   perennial, in herb gardens 859  
   treatment 411, 421, 424  
 Weeping fig 649  
 Weeping pear 564, 576  
 Weeping willow (500), (503), 525  
 Weevils (387), 389, 392, (394), (399), 401, (402),  
   404  
*Welgela* 491, 499, (527), 529, 530, 1102  
 Wellingtonia, history 21  
 Welsh onion 976  
 Western hemlock 559  
 Western red cedar 1143  
 Whin 528  
 White clover (417)  
 White currants 790  
 White currant wine 831  
 White mustard (418)

White sails 661  
 White spruce 558  
 White willow (499), 525  
 Whitebeam 576  
 Whitefly (399), 400, 641, 1004  
   as carriers of plant diseases 349  
 Whortleberry 529, 804  
 Wild bees, pollination by 727  
 Willow 291, (499), (503), 525  
   diseases 373  
   pollination 69  
   pruning 491, 499  
 Wilson, Ernest Henry 22, 24  
 Wilt (351), 371, 377  
 Wind grass 590  
 Window leaf 653  
 Window plant 625  
 Window-boxes 1080, 1110, (1110)  
   climbing plants for 1113  
   construction 1110  
   greenhouse plants for 1113  
   herbs for 859, 1113  
   ivy for 652  
   plants for 1112, 1113  
   roses for 256  
 Wineberries, Japanese 806  
 Wines 823-831  
   equipment for making 824  
   procedure for making 825  
   recipes 828  
   storing 828  
 Winter aconite 317  
 Winter cherry 17  
 Winter jasmine 546  
 Winter savory (860)  
 Winter sweet 543  
 Wireworms 280, (383), 384, 389, 1187, (1187)  
 Wisteria 491, 547, 1104  
 Witch-hazel 515, (516)  
 Withered tip disease 734  
 Woburn Abbey gardens 35  
 Wood ashes 104  
 Wood sorrel (346)  
 Woodbine 546  
 Woodlice (383), 384, 397, 1182, (1183)  
 Woodpecker 1171, 1173, (1173)  
 Woodrush (602)  
 Woody plants, regeneration 488  
 Woolly beard grass 592

Worcesterberry 808  
 Work, calendar of 425-447  
 Worms 641, 1169, (1169), 1182  
 Wren (1176), 1177  
 Writing with plants 1076

## Y

Yarrow 183, (417)  
 Yellow archangel 1106  
 Yellow currants 790  
 Yellow flag 474  
 Yellow turkscap 327  
 Yew (503), 528, 558, 560, 570, 1100, 1102  
   English (498), (503), 528, 558  
   pests (407), 409  
   pruning 488, 489  
 Youngberry 808  
 Yucca 1103  
   history 32

## Z

*Zantedeschia* 478  
*Zauschneria californica* 292, 293, 294  
*Zea* 593  
 Zebra plant 642, 662  
 Zebra rush 476  
*Zebrina* 662, 666, (675), 676, (678), 1115  
*Zenobia* 500, 529, (529), 530  
*Zephyranthes* 320  
 Zineb 365, 371, 372, 373, 376, 379  
*Zinnia* 168, 952, 1113  
   diseases 353, 364, 373  
*Zygocactus truncatus* 631





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*Printed in Great Britain by  
Hazell Watson & Viney Ltd., Aylesbury and Slough; Ben Johnson & Co. Ltd., York*



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